

Param Poojya Dr. Babasaheb Ambedkar Smarak Samiti's



Dr. Ambedkar College

Deeksha Bhoomi, Nagpur



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3.3.1

Number of research papers per teachers in the Journals notified on UGC website
during the last five years

Academic Year: 2019-20

Criterion 3

3.3.1. Number of research papers per teachers in the Journals notified on UGC website during the last five years

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Comparative Study of Symmetric Key Cryptographic Algorithms CAST, IDEA, RC, Camellia and SAFER

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ABSTRACT

Information security plays very important role in storing and transmitting the data through unsecured channel. In the network security, cryptography plays vital role to maintain the CIA triad that is Confidentiality, Integrity, Authentication and non-repudiation of information. Therefore the security of information is much important in data storage and transmission process. Cryptography also ensures that the message should be sent without any change and only the intended authorized person can be able to read the message. There are various cryptographic techniques developed for achieving secure communication. Using cryptography, the data is encoded before sending it and decoded after receiving, Cryptographic algorithms are broadly divided into two types, symmetric key and asymmetric key cryptographic algorithms. This paper deals with the comparative study of various symmetric key cryptographic algorithms CAST, IDEA, RC, Camellia and SAFER.

Keywords : Symmetric key cryptography, CAST, IDEA, RC, Camellia and SAFER

I. INTRODUCTION

Cryptography deals with the securing of digital data. It refers to the design of mechanisms based on mathematical algorithms that provide fundamental information security services. It is an establishment of a large toolkit containing different techniques in security applications.

Depending on the key used, cryptographic algorithms are divided into major two types:

- 1) Symmetric key or private key cryptography.
- 2) Asymmetric key or public key cryptography.

The private cryptography is an encryption process where key used to encrypt the message is the same as the key decrypting the message [1]. Private key cryptography is fast and efficient, making it ideal for large data transmissions. Private key cryptography is more effective when used with public key cryptography because it is much faster.

II. SYMMETRIC KEY OR PRIVATE KEY CRYPTOGRAPHY

Some symmetric key cryptographic algorithms are explained below:

2.1 Carlisle Adams and Stafford Tavares (CAST)

CAST was designed in Canada by Carlisle Adams and Stafford Tavares. They claim that the name refers to their design procedure and should conjure up images

of randomness, but note the authors' initials. The example CAST algorithm uses a 64-bit block size and a 64-bit key.

The algorithm uses six S-boxes with an 8-bit input and a 32-bit output. Construction of these S-boxes is implementation-dependent and complicated. CAST-128 is a DES-like substitution-permutation crypto algorithm, employing a 128-bit key operating on a 64-bit block. CAST-256 is an extension of CAST-128, using a 128-bit block size and a variable length (128, 160, 192, 224, or 256 bit) key. CAST is named for its developers, Carlisle Adams and Stafford Tavares and is available internationally. CAST-256 was one of the Round 1 algorithms in the AES process [2, 3].

2.2 International Data Encryption Algorithm (IDEA)

IDEA algorithm takes input text of size 64 bits at a time and divide it in evenly; i.e., 64 bit plain text is divided into 4 sub-blocks, each of 16 bits in size. Following are the basic operations needed in the entire process.

Operations needed in the first 8 rounds

1. Multiplication modulo $2^{16} + 1$.
2. Addition modulo 2^{16} .
3. Bitwise XOR.

Operations needed in the OUTPUT TRANSFORMATION phase

1. Multiplication modulo $2^{16} + 1$.
2. Addition modulo 2^{16} .

The above mentioned operations are performed on 16 bit sub-blocks. For simplicity of expressing the operations, we denote, Multiplication modulo $2^{16} + 1$ by * symbol, and Addition modulo 2^{16} by + symbol. And bitwise XOR will be represented by its usual symbol. Using 25-bit circular left shift operation on the original key, other subsequent sub-keys are produced, used in different rounds. For instance, among the total no. of 52 keys- Sub-key K1 is having first 16bits of the original key, sub-key K2 is having

the next 16 bits, and so on till sub-key K6. For ROUND1, sub-keys K1 to K6 use first (16x6=) 96 bits of the original cipher key. In ROUND2, sub-key K7 & K8 take the rest of the bits (bits 97 to 128) of the original cipher key. Then we perform circular left shift (by 25bits) operation on the original key. As a result the 26th bit of the original key shifted to the first position and becomes the first bit (of the new shifted key) and the 25th bit of the original key, moves to the last position and becomes the 128th bit (after first shift). This process continues till ROUND8, and also in the OUTPUT TRANSFORMATION phase; i.e., after the ROUND8, the key is again shifted left by 25 bits and the first 64 bits of the shifted key is taken for use, and used as sub-keys K49 to K52 in the OUTPUT TRANSFORMATION phase[4-6].

2.3 Rivest Cipher (RC)

RC algorithms were first invented by Ron Rivest. "RC" stands for Rivest Cipher. The RC algorithms are widely deployed in many networking applications because of their favorable speed and variable key-length capabilities [7].

RC1

RC1 was never published. It was the first step which Rivest took in order to proceed with designing a series of symmetric key algorithms popularly known as the Rivest Cipher Algorithms. Later, different variants were designed and continuous research has been carried out by the researchers. The main idea of research was to design a Symmetric Key encryption algorithm that could be used by the users to protect their data as it passes through the network.

RC2

It is a block encryption algorithm, developed in 1987. It was considered as a proposal for the DES replacement. It is a secret key block encryption algorithm which uses a variable size key from 1 byte to 128 bytes. It consists of input and output block size

of 64-bit each. This algorithm was designed to be easily implemented on 16-bit microprocessors. If the key encryption has been performed, then this algorithm runs twice as fast as DES. The algorithm itself involves 3 further sub algorithms viz. Key Expansion, Encryption, and Decryption. This was designed as a proposal to replace the existing DES Algorithm [8].

RC3

RC3 was broken before ever being used. When the RC3 algorithm was being developed at RSA security, It was broken at the same time. Hence, it was not used.

RC4

RC4 is a stream cipher, symmetric key encryption algorithm. The same algorithm is used for both encryption and decryption. The data stream is simply XORed with the series of generated keys. The key stream does not depend on plaintext used at all. A variable length key from 1 to 256 bit is used to initialize a 256-bit state table. Vernam stream cipher is the most widely used stream cipher based on a variable key-size. It is popular due to its simplicity. It is often used in file encryption products and secure communications, such as within SSL. The WEP (Wireless Equivalent Privacy) protocol also used the RC4 algorithm for confidentiality[9, 10].

A stream cipher using variable-sized keys; it is widely used in commercial cryptography products, although it can only be exported using keys that are 40 bits or less in length. RC4 is a stream cipher, symmetric key algorithm. The same algorithm is used for both encryption and decryption as the data stream is simply XORed with the generated key sequence. The key stream is completely independent of the plaintext used. It uses a variable length key from 1 to 256 bit to initialize a 256-bit state table. The state table is used for subsequent generation of pseudo-random bits and then to generate a pseudo-random stream which is

XORed with the plaintext to give the ciphertext. The algorithm can be broken into two stages: initialization, and operation. In the initialization stage the 256-bit state table, S is populated, using the key, K as a seed. Once the state table is setup, it continues to be modified in a regular pattern as data is encrypted.

The steps for RC4 encryption algorithm is as follows:

- 1- Get the data to be encrypted and the selected key.
- 2- Create two string arrays.
- 3- Initiate one array with numbers from 0 to 255.
- 4- Fill the other array with the selected key.
- 5- Randomize the first array depending on the array of the key.
- 6- Randomize the first array within itself to generate the final key stream.
- 7- XOR the final key stream with the data to be encrypted to give cipher text.

It was also used by many other email encryption products. The cipher can be expected to run very quickly in software. It was considered secure until it was vulnerable to the BEAST attack.

RC5

RC5 is a 32/64/128-bit block cipher developed in 1994. It was designed by Ronald Rivest for RSA Data Security (now RSA Security) in December of 1994. It is a symmetric block cipher having a variable number of rounds, word size and a secret key. It uses data-dependent operations heavily. It is a simple algorithm which has a low memory requirement. It is suitable for hardware or software. It is fast and also provides security if suitable parameters are chosen. This algorithm makes use of magic numbers. Due to the data-dependent rotations, differential cryptanalysis and linear cryptanalysis is not possible. The key used is strong if it is long. However, if the key size is short, then the algorithm is weak [11].

RC6

It was an AES finalist developed in 1997. It is a block cipher which uses 128 bit block size and supports key sizes of 128, 192 and 256 bits. It was designed in order to meet the requirements of the AES. It is an

improvement of the RC5 Algorithm. It provides even better security against attacks which may be possible in the RC5 Algorithm. It makes use of 4 registers (Each one of 32 bit) and is more secure than the RC5. It is also protected from various other possible security attacks. It uses fewer rounds and offers a higher throughput [12].

RC7

To improve the encryption efficiency of the already existing RC6 algorithm [13], RC7 has been proposed which takes relatively less time to encrypt data and is comparatively more flexible. Instead of four working registers, RC7 makes use of six such registers which makes it a better alternative to RC6 [14].

2.4 Camellia

A secret-key, block-cipher crypto algorithm developed jointly by Nippon Telegraph and Telephone (NTT) Corp. and Mitsubishi Electric Corporation (MEC) in 2000. Camellia has some characteristics in common with AES: a 128-bit block size, support for 128, 192, and 256 bit key lengths, and suitability for both software and hardware implementations on common 32-bit processors as well as 8-bit processors (e.g., smart cards, cryptographic hardware, and embedded systems). Camellia was jointly developed by Nippon Telegraph and Telephone Corporation and Mitsubishi Electric Corporation in 2000. Camellia specifies the 128-bit block size and 128-, 192-, and 256-bit key sizes, the same interface as the Advanced Encryption Standard (AES). Camellia is characterized by its suitability for both software and hardware implementations as well as its high level of security. From a practical viewpoint, it is designed to enable flexibility in software and hardware implementations on 32-bit processors widely used over the Internet and many applications, 8-bit processors used in smart cards, cryptographic hardware, embedded systems, and so

on. Moreover, its key setup time is excellent, and its key agility is superior to that of AES. Camellia has been scrutinized by the wide cryptographic community during several projects for evaluating crypto algorithms. In particular, Camellia was selected as a recommended cryptographic primitive by the EU NESSIE (New European Schemes for Signatures, Integrity and Encryption) and also included in the list of cryptographic techniques for Japanese e-Government systems which were selected by the Japan CRYPTREC (Cryptography Research and Evaluation Committees).

2.5 Secure and Fast Encryption Routine (SAFER)

Secret-key crypto scheme designed for implementation in software. Versions have been defined for 40, 64, and 128 bit keys. SAFER K-64 stands for Secure and Fast Encryption Routine with a Key of 64 bits. There are no patent, copyright or other restrictions on its use. The algorithm has a block and key size of 64 bits. It is not a Feistel network like DES, but an iterated block cipher: The same function is applied for some number of rounds. Each round uses two 64-bit sub keys, and the algorithm only uses operations on bytes.

SAFER K-64 is an integrated cipher in the sense that encryption is performed by applying the same transformation repeatedly for r rounds, then applying an output Transformation; $r = 6$ is recommended but larger values of r can be used if desired for even greater security. Each round uses two 8-byte (64-bit) subkeys determined by a key schedule from the secret 8-byte user-selected key. The output transformation uses another 8-byte subkey determined by the key schedule. One unusual feature of SAFER K-64 is that, in contrast to most recently proposed iterated block ciphers, encryption and decryption are slightly different (i.e., they differ by more than just the reversal of the key schedule).

This algorithm uses only byte operations in the processes of encryption and decryption, which makes

it particularly useful in applications such as smart cards where very limited processing power is available. Some bit-level rotations of bytes are used in the key schedule, but this is done "once and for all", i.e., until the user-selected key is changed. To achieve security with such simple processing, SAFER K-64 exploits following two new cryptographic concepts:

(1) an unorthodox linear transform, which we call the Pseudo-Hadamard Transform (PHT), that allows the cipher rapidly to achieve the desired "diffusion" of small changes in the plaintext or the key over the resulting ciphertext [It is usually the case in block cipher design that one struggles to obtain such diffusion by carefully selecting permutations to imbed within the cipher and then doing massive statistical testing to see which ones give acceptable diffusion. As will be seen, the PHT provides a systematic way to ensure that the cipher provides the necessary diffusion--in fact, the diffusion provided by the PHT appears to be better than that in any other cipher that we know and

(2) the use of additive key biases that eliminate the "weak keys" that plague most block ciphers. SAFER K-64 includes a recursive procedure for generating these key biases that is easy to implement and that provides the very "random" biases desired [15].

III. COMPARISON OF SYMMETRIC KEY ALGORITHMS

	CAST -256	IDE A	RC-6	Camell ia	SAFE R
Key Length	128,160, 192, 224 or 256	128	128,192 or 256	128, 192, 256	64
Block Size	128	64	128	128	64
Rounds	48	8.5	20	18 or 24	8

IV. CONCLUSION

Internet applications are growing very fast, so there is a need to protect such applications. Cryptographic algorithms play a main role in information security systems. In this paper a comparative study between CAST, IDEA, RC, Camellia and SAFER were presented into three factors, which are key length, block size, and number of rounds. From the study it is clear that, CAST-256 is found to be more secured as it requires more rounds the other compared algorithms.

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Comparative study between E-commerce and E-government

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Abstract

E-commerce and E-government have increasingly become a necessary component of decision strategy and a powerful catalyst for economic development within the global economy. Some time ago, we presented early insights from a comparative study of the two phenomena. This research paper shows that despite major similarities the two phenomena follow quite separate and distinct trajectories. E-commerce and E-government applications have made major role in their respective sectors, private and public. This paper reports on more robust findings from an ongoing empirical investigation and deepens our understanding of similarities and differences between E-commerce and E-government.

Keyword: E-commerce, E-government, B2B

1. Introduction

E-commerce and E-government have increasingly become a necessary component of decision strategy and a robust catalyst for economic development within the global economy. In step with our earlier study, E-commerce and E-government have plays different dimensions, priorities, and governing principles. While private-sector mainly target E-commerce applications at process simplification, service quality enhancements additionally as cost and labor savings, their public-sector counterparts see E-government applications as instruments for establishing an information technology (IT) architecture. Our pilot study further found that illuminating similarities and differences exist in (1) information management regarding the management of content, which was perceived as a serious challenge. Some differences were detected in areas like electronic record keeping, where the general public sector emphasized the legal liability issue as a main concern and driver, whereas the private. Differences were found within the extent and class of process redesign between the sectors. In (2) process management, although the transaction volumes in E-commerce were found larger than in E-government.

In the context of (3) stakeholder relations, the balancing of stakeholders' interests and managing their expectations was found similar in both E-commerce and E-government. Stakeholders in e Commerce preferred network approaches, while governments had preference for alliances to incorporate every important stakeholder. In addition, in e-Government we also noticed a commitment to ethics in commission to citizens, that we found no equivalent in e- Commerce. Finally, the (4) digital divide with relevance equal access, literacy, reach, language, content, and infrastructure was a serious



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concern in E-government practice. Interestingly, all preliminary findings hold in light of a much-expanded base of knowledge points.

2. Literature Review

We found that literary study on E-commerce and E-government is incredibly small. So, we had to seem at separate streams of literature to anticipate and isolate potential similarities and differences between E-commerce and E-government. On a more general plane, public-to-private differences are identified in three areas: The private sector has been also praised for its higher agility, greater resourcefulness, less burdensome bureaucracy, and stronger motivation to proactively innovate in comparison with public sector organizations. These differences also surfaced in an exceedingly study, which compared the strategic priorities of Chief Information Officers (CIOs) in both public and personal sectors. It had been found that public-sector CIOs focused on (a) the implementation of an IT architecture, (b) cultural change, (d) hiring/retaining skilled professionals, (e) and streamlining business processes, while private-sector CIOs emphasized (a) simplifying business processes, (b) improving services, (c) effective relationships with senior executives, (d) preventing intrusions, and (e) the implementation of IT architecture. Process changes via streamlining and repair improvement were more highly ranked by private-sector CIOs. Second, we introduce and discuss the study design followed by the presentation and discussion of our findings. (1) Environmental drivers and constraints, (2) organizational mandates and scope, and (3) internal processes, complexities, and incentives. Model relies on laws, statutes, and regulations providing citizens and firms with access to government information and services, and also delineating intergovernmental relationships, strategies, and interoperation of electronic government information. Also, in E-commerce several sub-models could also be found, which explain certain differences particularly in process management. (4) vertical and horizontal systems integration, (5) increased responsiveness and repair quality. Finally, as our own pilot study uncovered [6], similarities between E-commerce and E-government were found regarding (1) process improvements, (2) backend (process) integration, (3) cost savings, (4) information sharing. Differences between the sectors were found to prevail regarding (1) the drivers and motivations for E-commerce and E-government, (2) stakeholder expectations, and (3) resource availability.

3. Research Question and Methodology

The two central study questions of this research remained a similar as within the pilot: (1) What are similarities between private-sector E-commerce and public-sector E-government, and the way does it matter?

(2) What is different in private-sector E-commerce and public-sector E-government, and the way does it matter? within the absence of any related comparative research



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antecedents and with a rather thin theoretical foundation relative to the study problem at hand, we decided to continue with our resulting in a mesh of socio, technical, and organizational complexities, which challenge the reduction of the study problem to some variables. Study situation, particularly, since the interaction between participants results in rich data and high data quality.

We also stratified the sample using Anthony’s framework, which distinguishes between professionals, supervisors with operational control, managers, and strategic planners [1] and chose the managerial level for the pilot, since that level gave the impression to us high enough for capturing strategic aspects and motives furthermore as low enough to spot specifics of implementation and outcomes.

Within the private-sector focus group we ended up with a complete of 20 individuals from leading E-commerce-engaged organizations representing various industries, while we had 19 individuals from the general public sector representing the chief branch of varied levels of presidency. A complete of six focus groups was conducted with five to 6 participants each, that is, three groups for every sector. Likewise, we introduced the concepts of G2C, G2B, G2G, and government-to-employee (G2E) furthermore as IEE (see also figure 1) within the invitation letters to prospective participants from the general. Northwest, which has been found highly developed in both E-commerce (for example, Amazon.com, Boeing, Microsoft, etc.) and E-government .In the letter of invitation to prospective participants from the private sector, we verbally and graphically (see figure 1) introduced the concepts of business-to-consumer (B2C), business-to business (B2B), business-to-government (B2G),business to- employee (B2E), and internal effectiveness and efficiency (IEE).

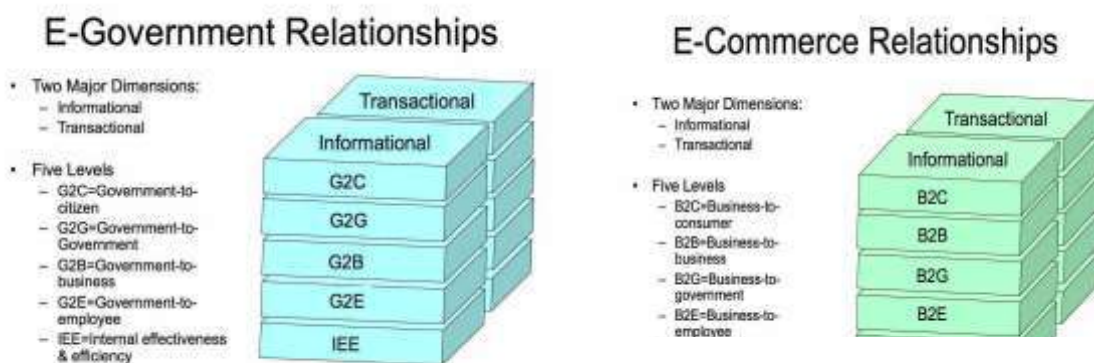


Figure 1 Relationships in e-Government and e-Commerce

For all six groups we introduced the 2 dimensions of Informational and transactional. They were organized as half-day focus group discussions with the chosen participants, first with the private sector participants, successive day with the general public sector participants. The moderator first introduced the main target group format to the participants; he then re-introduced the E-commerce and E-government concepts as already outlined within the invitation letters. He explained to participants that the primary session would be dedicated to the “informational” aspects of the five concepts



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followed by a second session on the “transactional” aspects. Before each session, participants were asked to organize and write down discussion points for every concept as far as those applied to their projects and skill. The moderator then launched the main target give-and-take with a gap question and facilitated the discussion, while three observers took notes and administered the recording.

Data Analysis

During this research paper we mainly used Strauss and Corbin coding methodology. First, the four researchers independently read the transcripts identifying units of information. Our feeling from the gathering exercise was confirmed during this phase that we had in reality managed to gather rich and high-quality data all told four sessions. Within the second pass, the 2 researchers read the transcripts again and consolidated the units of information. In an open coding process, each unit of information was then assigned to a preliminary category or subcategory whose dimensions and properties were developed from the information. New categories and subcategories were introduced, just in case existing categories didn't apply. In an exceedingly subsequent pass, an axial coding process was applied, during which the converged categories/clusters and subcategories (emphasized in small capitals below) were analyzed regarding their inherent structure and processes resulting in paradigms, whose internal relationships were identified wherever possible. Within the final pass, a selective coding process was performed, during which the resulting concepts and theories were associated with one another. In this section, we present our findings for five of a complete of 11 main categories or clusters of themes, which we were able to identify from the information. We highlight the most important elements and themes in each category/cluster by using Small Capitals. These five clusters, however, we found central to the understanding of similarities and dissimilarities in E-commerce and E-government. The four clusters comprise (a) Process management, (2) Information management, (3) Citizen/customer focus, (4) Stakeholder relation.

4.1 Process Management

Process Streamlining and Process Integration while initial applications would mostly only mimic existing processes electronically (“manumission”), new workflows are created and processes are redesigned (“business process design”) in additional recent projects, which help exploit the new technological capabilities in step with the practitioner experts in both E-commerce and E-government. In both sectors it absolutely was said improved internal and external service quality, process speed-ups, and consistent performance of transaction processing were among major driving forces for process redesign Also, the will to attain or improve vertical and horizontal process Integration and alignment at the side of fostering the interoperation between information systems of collaborating institutional partners were among the main drivers for introducing E-commerce information systems (ECIS) and EGIS. In government,



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service speed the experts said was still hampered because systems and processes weren't aligned to a tolerable degree. Also, not all transactions can be performed completely electronically because of media breaks or legal requirements.

Proposition #01: ECIS and EGIS are more practical when processes are streamlined and new workflows introduced.

Proposition #02: Organizations in both the general public and personal sector increasingly engage in redesigning existing processes and build new workflows to create better use of the potential of ECIS. Both ECIS and EGIS provide for top volumes of electronically processed transactions in a very cost-effective, speedy, and reliable fashion. Transactions involving citizens were still fragmented in step with the practitioners. However, compared with government within the private sector, transaction volumes gave the impression to be much higher. Overall, within the data from our sample, electronic transaction processing was found much more sophisticated and much more geared towards directing swift action or reaction within the private sector than in government allowing high organizational ability in E-commerce. In E-commerce, transactions were monitored in real time for problem detection, inventory adjustments, and capacity planning.

Proposition #03: Transaction processing is more sophisticated and proliferated in E-commerce than in e- Government.

Proposition #04: Innovative transaction processing methods are more likely found in E-commerce than in E-government.

Proposition #05: Historical data from transaction processing are more frequently analyzed and used for strategy development in E-commerce than in E-government.

Creating a supportive culture for collaboration strongly depends on conducive personal relationships between the choice makers of the collaborating entities it absolutely was said. The practitioners declared essential to its success the event of a proper governance structure for the collaboration.

Proposition #06: G2G collaboration is more practical between organizations of comparable size and similar governance structure than between organizations of dissimilar size and dissimilar governance structure. Experts of both sectors emphasized the increased opportunity for and engagement in institutional. Finally, formal agreements regarding the governance of collaborative efforts were found essential to the effectiveness and sustainability of a continued collaborative relationship between G2G partners.

Proposition #7 G2B/B2G collaboration reduces cost, overhead, and transaction completion time for each side.

In government-to-business (G2B) and business-to government (B2G) collaboration the ALIGNMENT OFF or that reason, in many G2B/B2G collaborative projects, the private sector partner took on the burden of developing, maintaining, and troubleshooting a collaborative G2B EGIS. Like in G2G collaboration, so in G2G/B2G collaboration, formal agreements governing the collaborative effort were found essential to their effectiveness and sustainability

4.2 Information Management

Proposition #8: Lower information quality affects E-commerce more negatively than E-government Information Quality as a Key Factor



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In E-commerce, most information appears to originate from or relate to in-house transactional data sources. Those data were found to be more refined and more ready for mining than in government.

Proposition #9: The higher the information quality the more effective is information management in both E-commerce and E-government.

Proposition #10: Maintaining acceptable levels of information quality is more challenging in E-government than in E-commerce due to the higher volume of information in government.

Information Sharing

In government, which appears as more information rich than the private sector, insufficient IQ, non-reliable EGIS, incompatibilities, and lack of information integration it was said frequently still hampered the sharing of information. High accessibility, sufficient performance, and high IQ were identified as major facilitators of information sharing in both sectors. Many government agencies put much effort into better information integration for the purpose of sharing.

Content Management

Even more than in commerce, website content management was found a major challenge in government. Quite a few participants pointed out those government agencies were lacking a sound strategy for the management of content. Government agencies obviously try to strike a balance between citizens' need for information and the extent of government services to provide that information electronically. Proposition #11: Content management is more challenging in government than in the private sector due to volume of information and complexity of linked content.

4.3 Stakeholders Relations

Additional thematic analysis did not yield additional major concepts than previously reached in pilot. This demonstrates that the cluster is reaching a maturity stage in terms of developing a theory. Three areas needing attention appeared in E-government: i) Governance; ii) Collaboration and iii) Diversity of stakeholders as opposed to E-commerce, which mainly emphasized diversity of stakeholders only.

Governance in E-government Relations

The governance description reflected an ongoing concern in the E-government side regarding management and control of governance structure. This appeared particularly important due to a clear border between elected officials and nominated professional staff [20]. The importance of governance was also reflected through emphasizing power struggles among different stakeholders to achieve their particular interests and the fear of stakeholders from losing control. Proposition #12: Stakeholders governance structure influences ECIS and EGIS design and deliverables.

Diversity of Stakeholders



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This ties up nicely to the next narrative, diversity of stakeholders. To achieve a stable and balanced governance structure one needs to balance relationships among different types of stakeholders, elected and nominated officials, political and professional staff, and federal and local stakeholders. This objective becomes even harder when the boundaries of the system are rigidly fixed for a long period, most of the professional staff remains, the needs are vast and the interests are quite different from each other, pulling into different directions [12]. For example, participants reported the fear to partner with “a too big city”, and to create dependency on their resources and governance structure. Diversity appeared as a critical issue also for the e-Commerce sector due to shaky, temporary and unstable partnership structures.

4.4 Citizen/Customer Focus

CITIZEN/CUSTOMER NEEDS define much of the way processes and deliverables of technologies are designed both in E-government and E-commerce. The pilot highlighted the robust process B2C implements to deliver a product or a service: understand CUSTOMER NEEDS through mechanisms of surveys and TRACKING behavior; gathering this information makes it possible for companies to specialise in HIGH VALUE CUSTOMERS and to focus on SEGMENTS of shoppers per personal characteristics; creating TAILORED BRANDS and services to those particular segments of population; finally, since needs are DYNAMIC, companies need to repeat this process. The most goal of the above illustrated process is to focus on customers per their needs and lock them in with the service/product these companies suggest.

Needs serve in B2C as an instrumental good since is that they are valued because they cause something else, a bottom-line result, while for G2C needs of citizens function an intrinsic good, that's they're valued for his or her own sake. Proposition #13: In both the private and public sectors designing information systems is extremely influenced by customer needs, or citizens' needs respectively.

Proposition #14: Targeting customers via identifying individuals or groups is more sophisticated and frequent in E-commerce than targeting citizens in E-government. Creating a robust Customer Experience The other side of the coin of unveiling the customer needs in B2C is creating these needs through shaping the CUSTOMER EXPERIENCE. While traditionally marketing were the one mainly inquisitive about the customer experience perspective, recently other departments including R&D joined in shaping and creating this experience. Some aspects could be controllable by the businesses, e.g. creating a SOCIAL ENVIRONMENT, enhancing a simple and customised online experience, and partially learning the way to work with customer EMOTIONS effectively through the technology.

4.5 Discussion and Summary

We started out to research, identify, and characterize the similarities and differences between E-commerce and E-government since we believed that the findings from such a study would benefit academic knowledge within the following we discuss and summarize our observations and insights. According to our findings both ECIS and



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EGIS benefit their respective organizations significantly more when the underlying workflows and processes don't seem to be only electronic re-embodiments of their paper-based antecedents but rather streamlined, simplified, or completely discarded and replaced by different workflows and processes, which take full advantage of the technology. A great incentive for streamlining and redesigning workflows and processes we found within the increased degree of collaboration within and between the sectors, which has become possible.

Interestingly, cross-sector collaboration supported ECIS/EGIS reduces cost and accelerates the method on both ends though the private-sector partner provides systems, infrastructure, and maintenance. Along with transactional collaboration and integration we found increasing collaboration within and across sectors also within the area of knowledge sharing. Information quality played a critical role during this context. A regeneration between perceived IQ, information sharing, and also the strength of the link gave the impression to exist. In E-commerce, organizations were inquisitive about providing a social environment, which was conducive to a positive experience as a customer. These findings suggest that ECIS/EGIS-related phenomena have important characteristics in common, which transcend the mere technical resemblance of systems and methods. Process redesign practices can be a worthwhile subject of further study. We found in both sectors that similar governance structures of organizations influenced how collaborative remarkably, in both sectors the perceived needs of citizens (and customers, respectively) strongly influenced the designs of respective systems.

On the opposite hand, informatics and management, including the archiving of electronic records we found rather more developed within the public sector than with private firms. Yet, private sector firms were found to form much more elaborate use of historical data and data in processing so as to optimize desired organizational outcomes than government agencies. Lower information quality was also found to steer to more immediate and economically more negative effects in E-commerce than in E-government. Still, governments struggled over commercial organizations to keep up acceptable levels of knowledge quality resulting in far greater challenges, as an example, in content management. Interestingly, leadership in government gave the impression to be more supportive of (in particular, collaborative) e projects than their commercial counterparts.

It also those collaborative structures within the public sector were markedly stronger than those within the private sector. Although many EGIS initiatives seemingly greatly cared about citizens' involvement and participation, we found that personal firms had a footing in creating a customer experience." Transaction processing was found more sophisticated and of far higher volume in commerce than in government.

Present finding, we noticed that citizens were much more influential within the design of EGIS than customers were within the design of ECIS. Overall, what we found different between E-commerce and E-government suggests that the 2 phenomena follow different trajectories despite many similarities and technical commonalities. One obvious explanation lies within the sector-specific differences, which produce different drivers also during this area. It'll be interesting to research to what extent Enterprise Resource Planning (ERP) systems, which are increasingly introduced in government,



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may help align the trajectories between E-commerce and E-government to a better degree than we found during this study.

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IMPACT OF IT FOR CREATING A MORE EFFECTIVE FINANCIAL SYSTEM IN INDIA

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Abstract:

The use of IT solutions for providing banking facilities at doorstep holds the potential for scalability of the financial inclusion initiatives. The recent developments in banking technology and expansion of telecommunication network in the hinterlands of the country have provided the perfect launch pad for extending banking outposts to remote locations without having to open bank branches in the area. The RBI's Annual Policy for 2016-17 also urged the banks to scale up efforts for IT-based financial inclusion and develop technologies that are highly secure, amenable to audit and follow widely accepted open standards to allow inter operability among the different systems adopted by different banks. The RBI has set up an advisory group for IT-enabled financial inclusion to facilitate development of IT solutions for delivery of banking services. The present paper discusses about the importance and recent initiatives of IT based financial inclusion; and models of delivery of IT- enabled banking services to rural areas.

Key words: *Financial Inclusion, Financial Exclusion, Financial Services*

Introduction

Financial inclusion is considered to be critical for achieving inclusive growth; which itself is required for ensuring overall sustainable overall growth in the country. Financial inclusion may be defined as the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost. The approach to financial inclusion in developing countries such as India is somewhat different from the developed countries. In the latter, the focus is on the relatively small share of population not having access to banks or the formal payments system, whereas in India, majority of the population are excluded from financial system. Financial exclusion can be thought of in two ways. One is exclusion from the payments system i.e. not having access to a bank account. The second type of exclusion is from formal credit markets, requiring the excluded to approach informal and exploitative markets. The financially excluded sections largely comprise marginal farmers, landless labourers, oral lessees, self employed and unorganised sector enterprises, urban slum dwellers, migrants, ethnic minorities and socially excluded groups, senior citizens and women. While there are pockets of large excluded population in all parts of the country, the North East, Eastern and Central regions contain most of the financially excluded population. There are a variety of reasons for financial exclusion. In remote, hilly and sparsely populated areas with poor infrastructure, physical access itself acts as a hindrance. From the demand side, lack of awareness, low incomes/assets, social exclusion, and illiteracy are different reasons act as barriers. The requirements of independent documentary proof of identity and address can be a very important barrier in having a bank account especially for migrants and slum dwellers. From

the supply side, distance from branch, branch timings, cumbersome documentation and procedures, unsuitable products, language, staff attitudes are common reasons for exclusion. All these result in higher transaction cost apart from procedural hassles.

IT Solutions for Financial Inclusion

The use of IT solutions for providing banking facilities at doorstep holds the potential for scalability of the financial inclusion initiatives. Pilot projects have been initiated in the country by using smart cards for opening bank accounts with biometric identification. Link to mobile or hand held connectivity devices ensure that the transactions are recorded in the banks books on real time basis.

Some State Governments are routing social security payments and payments under the National Rural Employment Guarantee Scheme through smart cards. The same delivery channel can be used to provide other financial services like low cost remittances and insurance. The use of IT also enables banks to handle the enormous increase in the volume of transactions for millions of households for processing, credit scoring, credit record and follow up.

The recent developments in banking technology and expansion of telecommunication network in the hinterlands of the country have provided the perfect launch pad for extending banking outposts to remote locations without having to open bank branches in the area. In short, technology has to enable the branch to go where the customer is present, instead of the other way around. Further, RBI's Annual Policy for 2007-08 also urged the banks to scale up efforts for IT-based financial inclusion and develop technologies that are highly secure, amenable to audit and follow widely accepted open standards to allow inter operability among the different systems adopted by different banks. The enabling provisions and support of RBI has facilitated successful pilot projects in use of IT for extending the banking outreach for the "excluded". These projects are premised on technology which uses hand-held devices and connectivity with host computers through General Packet Radio Service (GPRS) / Global System for Mobile Communications (GSM) / Code Division Multiple Access (CDMA) / landline networks. The devices also come in several forms like Simputers (Simple Inexpensive Multi-lingual Computers) / personal digital assistants, programmed mobiles, etc. There are also rural biometric ATMs, which have been introduced by banks and found to be very popular among rural masses. Some major banks are introducing low cost rural ATMs for cash dispensing and other services in rural areas.

The RBI has set up an advisory group for IT-enabled financial inclusion to facilitate development of IT solutions for delivery of banking services. The issue of using technology as a driver is of the opinion that the requirement of rapid financial inclusion as a national goal can only be achieved by using appropriate IT. The creation of a national database, sectorised, geographic and demographic reports, and also a payment system among the cardholders to benefit the under privileged unbanked population of the country is not possible without extensive use of IT. This alone can bring down the costs of the small ticket transactions of the financially included and make nationwide financial inclusion a reality. The technology suppliers and banks should evolve common minimum standards for ensuring inter-operability between their systems. Use technology to reduce cost of delivery. A recent Boston Consulting Group report estimates that the cost of funds today is 9 per cent, provision for bad debts is 10 per cent and cost of consumer acquisition and transaction and operation cost is 13 per cent for the poorest customers, leading to banking for the poor becoming unprofitable. The key role that technology has to play is to reduce the last two components drastically. Reducing these costs can translate into lower lending costs, which would help improve the viability of risky rural businesses and allay concerns

that the high cost of lending to poorer segments is resulting in over indebtedness. Equally, distances are large in rural areas and transport sparse.

Here again, communications technology could play an important role by bridging the last miles between the customer and the provider and thus facilitating transactions. Transaction and operation costs consist of front-end costs, network costs and back-end operation costs. Back-end costs for banks vary from Re 1 to 2 per transaction. While banks have done a good job in computerizing their operations, they need to learn from mobile operators and optimize back-end technologies and leverage volume to significantly reduce these costs.

The front-end continues to be the dominant costs for banks. The use of ATMs has significantly reduced front-end costs but they are still too high. Banks need to promote lower costs indigenous ATM technologies, especially for rural areas. Going beyond ATMs, front-end costs can be brought to negligible amounts by replacing cash transactions with electronic transactions. More than 80 per cent of India's financial transactions are processed in physical cash. Cash as means of payment has a large cost in terms of handling, transaction processing, holding and risk of loss. On the other hand, Internet banking transactions have zero front-end cost for the banks; efforts have to be made to make this a preferred mode of transactions for large corporations. Its extension to SMEs may have much larger impact. Rural Internet Kiosks can be used by all rural businesses to carry out such transactions. Mobile banking is perhaps the most promising front-end technology for facilitating financial inclusion in India, especially for individual customers. The telecom and the banking industry along with RBI has recently constituted a Mobile Payment Forum of India (MPFI) to examine technological, regulatory and business constraints related to the scaling up of mobile banking in India. This Forum's recommendations would be the key to provide a roadmap for mobile banking. Additionally, Stored Value Cards would be another important vehicle for financial inclusion. There is a need to create common payments systems with participation by multiple banks, to reduce transaction costs and substantially increase the deployment and utilization of POS terminals. An important advantage of all these interfaces is that they are essentially cash-less and minimize fraud and the costs related to cash handling. Further, technology can be significantly leveraged for acquiring customers. Banking correspondents (BC) with Internet Kiosks at villages as well as BCs armed with mobile phones with back-end interface (e.g., the kirana shop) has to be used extensively. A unique ID for each citizen would help accelerate this. Finally technology has to be used to reduce provisions for bad debt. Credit ratings for retail customers and a unique citizen ID are critical in this regard. Capturing all the transactions electronically and mandatory sharing of data with a credit bureau would significantly help in this direction. The absence of this and high provision for bad debts, is in fact hurting the poorest most. The role of public policy is to enable the adoption and scale up of appropriate technologies while mitigating risks of their misuse. Public policy can play an important role in the establishment of a unique identification number and the promotion of biometric authentication, which would facilitate the development of credit bureaus.

Models of IT Based Delivery of Financial Services

1. ICT Based Solution

International Institute of Information Technology, Bangalore has developed an ICT based Solution in which the banking services delivery can be done using the electronic platform. The three key principles used in this model are –

a) unbundling and outsourcing non-statutory services needed for banking and establishing digital rural information infrastructure

b) automating the workflow, the records management and follow-up and recovery, and c) the use of entrepreneurship model for achieving effectiveness, efficiency and economy in the performance of the rural information infrastructure, rural information services and other follow-up functions e.g., credit rating of rural individuals and analytics for decision support. An ICT-based solution focuses on improving the delivery of credit and other services of the rural areas. The solution proposes common infrastructure for the rural data collection and information management and processing and the sharing of the delivery channel by the banks with a view to substantially reducing the transaction costs and improving the speed and quality of delivery. The elements involved in the solution are the establishment of a data centre and ensuring its two-way connectivity to the mobile multi-service delivery system available at the villages for providing the banking, extension and other services as well as connectivity to all the concerned banks and other service-providing agencies. The solution involves the outsourcing of the data management as well as of the delivery channel establishment and operations with required safeguards regarding the data ownership and operations. The model envisaged provides a cost-effective but efficient technology platform for rural banking. Technologically, the solution involves four main elements: such as establishment of digital rural information infrastructure; multi service delivery system; integrated multi-entity database system; and service provider's workstation. The Figure 1 gives a diagrammatic representation of the Model.

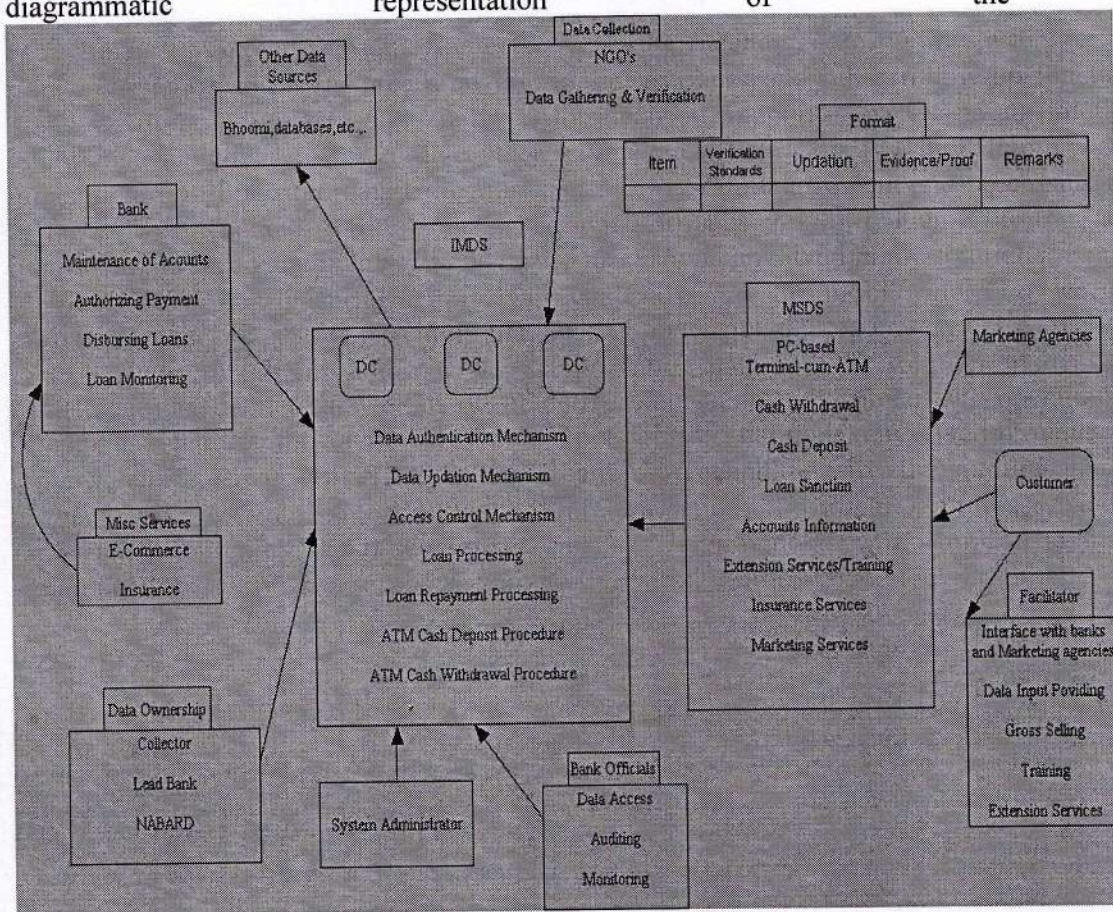


Figure 1: Diagrammatic Representation of the ICT Based Model

2 Primary Agricultural Co-operative Societies as Village Knowledge Center (PACS -VKCs)

The Government of India (GoI) has sought World Bank assistance to support a comprehensive reform program to transform India's Rural Cooperative Credit System (CCS)—comprising over 108,000 village level Primary Agricultural Societies (PACS), 367 District Central Cooperative Banks (DCCBs) and 30 State Cooperative Banks (SCBs)—into robust and reliable providers of finance to the rural poor, particularly small and marginal farmers. In January 2006, GoI announced a reform package designed to transform the potentially viable CCBs into democratically governed, efficiently managed, financially sustainable, self-reliant entities that can provide a wider range of financial services to the rural poor on more affordable terms. States are free to participate in the package on a voluntary legal, regulatory and institutional reforms to address the governance and operational weaknesses affecting CCBs. Promoting PACS as Village knowledge Center allows Rural Customer to look at PACS for short and long term needs through multi offerings including Financial Services, Citizens' Services, Agro Advisory & Market Information and Educational & Support Services. This Approach would attract the rural customers and village community to PACS as Village Knowledge Center for multiple services and develop loyalty. In the long term, a rural consumer would be less influenced by informal channels such as local money lenders. As the physical infrastructure already exists for the PACS, they are evolved as model centers of transformation of rural economy. Rather than dependency on financial revival packages, PACS can evolve into highly independent commercial business center offering multiple services, apart from banking and financial services. This Approach involves: - tying up with 3rd Party Business Entities for Services Offerings; and multi-Agency Services Delivery Approach through NGOs & SHGs. It is a 4 tier Approach and involves modules at each of the highlighted tier (Figure 2). This Model relies on ICT based Solution in which the banking & other value added services delivery can be done using integrated technology and communication

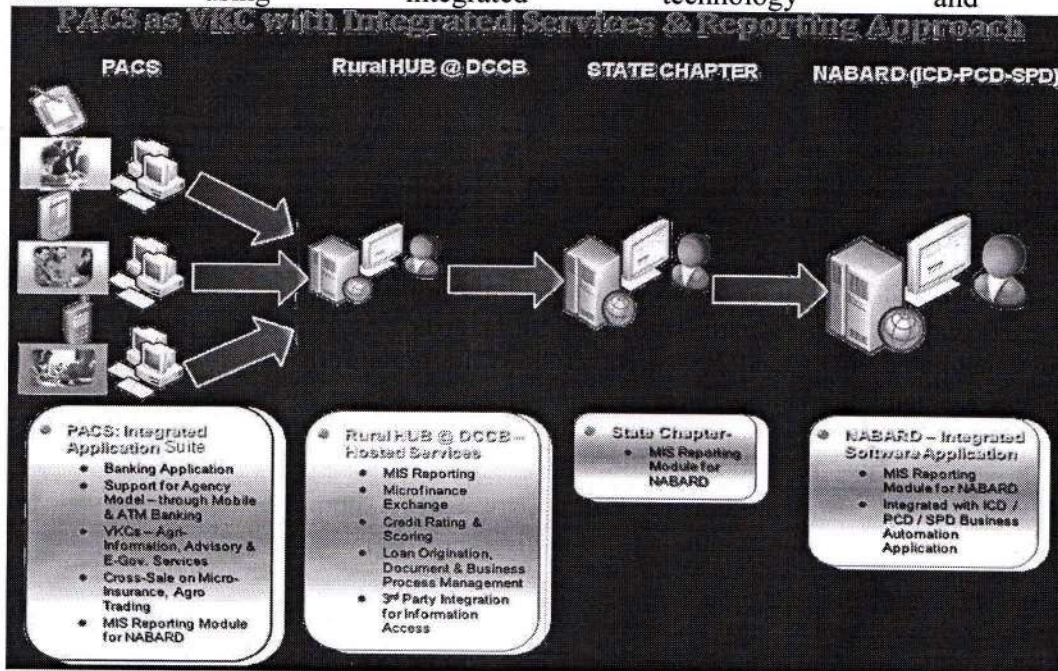


Figure 2: PACS as Village Knowledge Center – A Technology Approach

3 Other Models and Cases on the Use of Technology

- **GANASEVA Model** - The project was implemented in five villages in the Honavar block of the Uttara Kannada district of Karnataka, having approximately 4000 families, involved in essentially agricultural activity. The banks which are participated in this project are State bank of India, ING Vysya Bank, Syndicate Bank, who has agreed to use the data / documents available through the system. Besides the rural information service and credit rating, there is support in the system for the crop loan and Kisan Credit Card and Savings Bank Account Operations. The Project also wanted to link the Primary Agricultural Co-operative Societies (PACS) to the system for providing banking services through their automation.

- **Union Bank of India-** Union Bank of India has launched doorstep banking operations in rural areas of Uttar Pradesh using biometric smart cards. The bank has launched a pilot project in Chahania block in Chandauli district with FINO and Cashpor Micro Credit Ltd., an MFI. FINO provides technical support, which enables the bank to leverage technology to service rural customers. Union Bank of India has introduced biometric cards for vegetable vendors through Hawkers' Association of Mumbai and opened „no-frills“ accounts for them, which will help them deposit money and take loans. The bank is working with FINO in issuing the smart cards. These cards store data on the customer and the account. The banking correspondent, Fintech Foundation, appointed by FINO, goes to these hawkers with point of transaction devices. By swiping the card through these hand-held devices, hawkers can deposit their savings or borrow money. The data from the cards, stored on the terminals, is later transferred to the bank's servers.

- **Punjab National Bank (PNB)** - Punjab National Bank is working with FINO to roll out smart cards for the rural population in Rajasthan. FINO would enable PNB's zero-balance savings account customers to carry out transactions by providing FINO smart cards and point of transaction devices. The project aims at catering to PNB's rural clients across the country. Insurance Company is introducing biometric cards in rural and semi-rural areas. ICICI Lombard plans to offer biometric cards to families under group health insurance schemes. The card enables policyholders to get hospital treatment without making any advance cash payment.

- **ICICI Prudential Life Insurance Company-** ICICI Prudential Life Insurance Company has launched the use of biometric smart cards for their rural policyholders to pay premiums. Biometric cards contain details of the policyholder such as name, age, address and finger print information. The card enables them to move away from the connectivity and infrastructure barriers and provides real time solutions to policyholders in rural areas.

Conclusion

Technology-based solutions can be used by formal financial institutions to provide a range of financial services to the poor and support the drive for financial inclusion. The effective use of technology can help standardize processes in banking and microfinance as well as reduce the cost of operations. Through technology, banks have the potential to reach out to millions of poor and „unbanked“ people through the use of automated teller machines (ATM) and Point-of-Sale (POS) networks. For the sustained financial inclusion, there is a need for creation of a nationwide electronic financial inclusion system (NEFIS) that would link bank accounts and allow funds to be transferred into them electronically. Such mechanisms can present a saving to the government, both in terms of administrative burden and in terms of cost. There is also a need for the Rural Information Infrastructure for the collection of comprehensive data about the social and economic aspects of the 700 + million rural people at the level of individuals in a self-validating and ready-to-use form and for updating the data on an ongoing basis and managing and processing this data for making it available to the various users viz., the banks, the governmental authorities and various service and utility providers for enabling the delivery of high quality services to the rural people in a cost effective manner.

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REPOSITIONING NSAIDS AND CURCUMIN FOR CHEMO PREVENTION OF LUNG CANCER

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ABSTRACT

Non-Steroidal Anti-inflammatory Drugs (NSAIDS) are the most prescribed analgesic medication for many conditions due to their analgesic, anti-inflammatory and antipyretic properties. NSAIDs have the ability to inhibit the enzyme cyclooxygenase (COX), thus, targeting the prostaglandin (PG) pathway, which can result into prevention and treatment of cancer. This study aims to reposition NSAIDs for management of lung cancer, as it is cost effective and less time consuming since clinical trials of the drugs is already completed. Based on previous findings, five NSAIDs were selected from different classes' viz., diclofenac, naproxen, ibuprofen, tolfenamic acid, and celecoxib to investigate their chemo-preventive effects. We studied the cytotoxic effects of NSAIDs and investigated the synergistic effect of

NSAIDs with curcumin on lung cancer cell line A549. Cytotoxicity assays were followed by *in-silico* docking studies. Studies on repositioning of drugs would be beneficial in developing non-invasive cancer management modalities.

KEYWORDS: Repositioning NSAIDs, Cytotoxicity, *in silico* Docking.

INTRODUCTION

Lung cancer is malignant lung tumor characterized by uncontrolled cell growth in the tissue of lung. It is the leading cause of death among men and women world-wide and a major public health challenge in India.^[1] Drug repurposing is application of already approved drugs and compounds to treat different diseases. The anti-inflammatory effect of NSAIDs arises from their ability to inhibit cyclooxygenase (COX) enzyme also known as prostaglandin-

endoperoxide synthase (PTGS) (EC No 1.14.99.1).^[5] They are the rate-limiting enzymes which catalyze the bis-dioxygenation and subsequent reduction of arachidonic acid (AA) to prostaglandin (PG).^[6] COX-1 is constitutively expressed in most tissues, whereas COX-2 is induced in inflammatory cells and in human tumors by cytokines and tumor promoters.^[4] A number of COX-independent target of NSAIDs have been proposed to mediate the cancer chemo preventive properties of NSAIDs, including 15- lipoxygenase, Ras, PPAR, NF- κ B^[10], PDK-1/Akt, phosphodiesterase as well as others.^[7] NSAIDs have the ability to inhibit the enzyme cyclooxygenase (COX), thus, targeting the prostaglandin (PG) pathway. They exert their activity by blocking the conversion step. Five different NSAIDs from different classes (**viz., diclofenac, naproxen, ibuprofen, tolfenamic acid, and celecoxib**) and curcumin have been selected to investigate the cytotoxic effect of NSAIDs and the synergistic effect of NSAIDs and Curcumin on lung cancer cell line (A549). Diclofenac plays an important role in oncological practice in treatment of cancer related pain and as topical treatment for actinic keratosis, which is commonly viewed as pre-cancerous lesion effect. It is a potent inhibitor of COX2 and prostaglandin E2 synthesis. Many anticancer effects of diclofenac are associated with reduction in PGE2 level.^[2] Naproxen shows its effect by inhibiting the PGE2 synthesis by inhibiting the COX activity in CRS. Naproxen shows protective effects as an anti-inflammatory agent and lately as an anti-cancerous agent due to the similar molecular pathways that exist in both inflammatory diseases and cancer.^{[3][13]} Tolfenamic acid is a NSAID exhibiting anti- cancer activity in pancreatic and colorectal cancer. The effects are related to activation of p38 mitogen activation protein kinase (MAPK) pathway. Celecoxib dose dependently suppressed tumor growth, lung metastasis and angiogenesis in experimental model. It inhibits growth and induces apoptosis of human NSCLC cells independent of COX- Celecoxib.^[6] The mechanism of action of ibuprofen is non-selective, which involves reversible inhibition of COX1 and COX2.^[8] The Wnt/catenin and NF κ B pathway are important in promoting tumor growth and metastasis. Ibuprofen was found to inhibit both these pathway by reducing β -catenin translocation to nucleus in association with reduced cyclin D1 expression.^[8] Curcumin is a polyphenol (1, 7-bis(4-hydroxyl-3 methoxyphenyl)-1,6- heptadiene-3,5-dione) and an anti-inflammatory compound that interacts with numerous extracellular and intracellular molecules which are involved in cancer initiation and progression. The mechanism by which chronic inflammation drives cancer initiation and progression is via increased production of pro-inflammatory mediators, such as cytokines, chemokines, reactive oxygen species overexpression of oncogenes, cyclooxygenase2, matrix metalloproteinase and other intracellular signaling pathway mediators, transcription factors

such as nuclear factor K β (NF- κ B), signal transducer and activator of transcription 3 (STAT3), protein kinase B (AKT), and activator protein 1 (AP1) that drive tumor cell proliferation, transformation, invasion, metastasis, angiogenesis, chemoresistance, and radio-resistance.^[9]

MATERIALS AND METHOD

Chemicals

Dulbecco's Modified Eagle Medium (DMEM) High Glucose (code no. AT-0071), 10% Fetal Bovine Serum (code no. RM9970), Trypsin-EDTA Solution (code no. TCL099), 1% Antibiotic-Antimycotic Solution (code no.A002) (Penicillin, Streptomycin and Amphotericin) and Curcumin (code no. 30031) were obtained from Himedia Inc., India. Tolfenamic acid, Naproxen, Celecoxib, Ibuprofen and Diclofenac were obtained in good sealed condition before the study and were stored in a dry clean well-ventilated area at room temperature between 15 -25⁰C.

Cell lines

The anticancer effect of the selected NSAIDs and curcumin was studied on A549 lung adenocarcinoma cell line procured from NCCS Pune. It was maintained in DMEM with 10% FBS and 1% penicillin/streptomycin in T25 vented adherent flasks at 37⁰C with 5% CO₂.

Drug Concentrations

Tolfenamic acid (0.002g) and Diclofenac (0.003g) were dissolved in 1ml DEPC treated water. Naproxen (0.002g) and Celecoxib (0.003g) were dissolved separately in 50% DMSO, Ibuprofen (0.002g) and curcumin (0.003g) were dissolved in 1ml ethanol. Cells were seeded into 96 titre well plate by counting the cells using a hemocytometer (improved Neubauer) chamber. The seeded plate was treated with individual doses of drugs. Tolfenamic acid, diclofenac, naproxen, celecoxib, ibuprofen were tested at different concentrations viz., 25 μ M, 50 μ M, 60 μ M, 75 μ M, 100 μ M and curcumin 5 μ M-25 μ M for different time intervals (24hr- 96hr). After individual NSAID and curcumin was tested at the aforementioned concentrations, the cell line was treated with 2, 3, 4 and 5 combinations of the NSAIDs with the significant concentration of each.

Cell viability assay (MTT assay)

This assay measures the cytotoxicity of selected drugs and curcumin on A549 cell line using a yellow colored 3-(4, 5-dimethylthiazol-2-yl)-2, 5- diphenyltetrazolium bromide dye which gets reduced by mitochondrial succinate dehydrogenase into an insoluble purple colored

formazan crystals which can be measured colorimetrically by dissolving it in DMSO. 100µL of the media containing MTT was added to each well in the plate. The plate was wrapped in an aluminum foil and incubated for 4 hours in a humidified atmosphere at 37°C to allow the formation of the formazone crystals. After the incubation period, the medium and MTT from the wells was removed, and the remaining MTT-formazan crystals were dissolved by adding 100µL of DMSO to all the wells. Absorbance was recorded at 570 nm immediately.^[15] Each assay was performed in triplicate wells. This experiment yielded the individual effective doses of the selected drugs and curcumin. To obtain the synergistic cytotoxic effects on A549 cells, the cell line was then treated with 2, 3, 4 and 5 combinations of the aforementioned drugs.

Data analysis

The results obtained from MTT assay were analyzed statistically by one-way ANOVA. $P < 0.05$ was considered to be significant.

In Silico studies

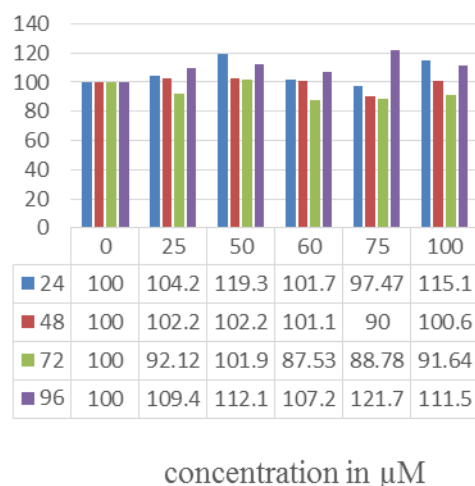
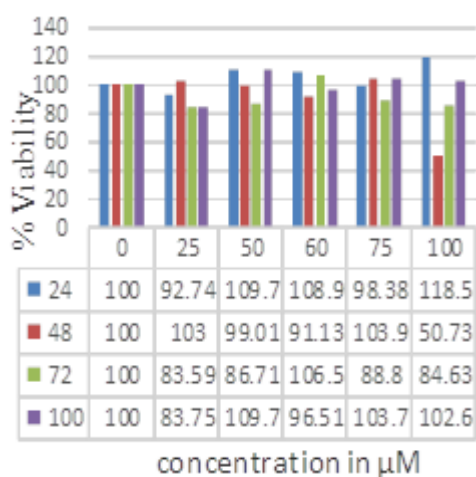
In-silico docking studies were undertaken to corroborate the results of the *in-vitro* work, using Autodock 4 suite (version 1.5 6rC2).^[14] Molecular docking was done to study the interaction of ligands (i.e., selected NSAIDs and curcumin) with active site residues of the enzymes Cyclooxygenase 1 and Cyclooxygenase 2.^[14] The ligands viz, Naproxen, Tolfenamic acid, Ibuprofen, Diclofenac, Celecoxib, Curcumin and Standard chemotherapeutic agents viz, Etoposide, Paclitaxel, Irinotecan were docked with Cyclooxygenase 1 and Cyclooxygenase 2 enzymes. On the basis of binding energy and their interactions, docking results were analyzed. Proper identification of this binding pose of related ligands is important in establishing a structure-activity relationship in lead optimization. Another use of scoring function is to rank different ligands to predict their relative experimental activity. Molecular docking study identified selected NSAIDs and curcumin, which can be effectively implemented as repurposed therapy in lung cancer management after further systematic scientific investigations.

RESULTS AND DISCUSSION

Selected NSAIDs tolfenamic acid, naproxen, ibuprofen, celecoxib and diclofenac and curcumin were repurposed for lung cancer management by assessing their cytotoxicity on A549 cell line. The MTT Assay was performed for assessing the individual cytotoxicity of the selected NSAIDs and curcumin, as well as, their synergistic effects in various

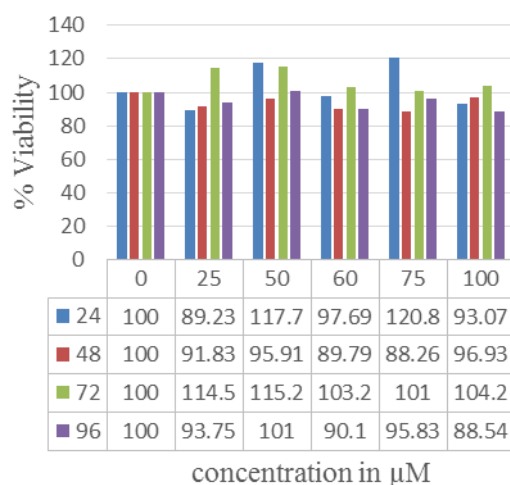
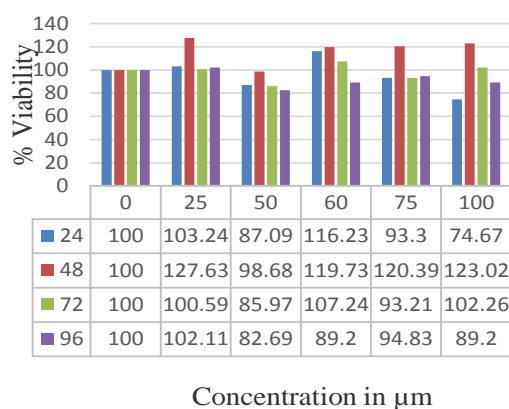
combinations. The results in the graphs 1-6 indicate that tolfenamic acid inhibits the growth of cells at 25 μM , 100 μM , when treated for all the time intervals viz., 24, 48, 72 and 96 hours. Naproxen shows inhibition at 25 μM , 50 μM , 75 μM , 60 μM when treated for all the time intervals studied. Ibuprofen inhibited the growth of cells at 75 μM , 60 μM while diclofenac inhibited the growth of cells at 100 μM , 50 μM , when treated for 24, 48, 72 and 96 hours respectively. Celecoxib inhibited the growth of cells at 25 μM , 75 μM , 100 μM when treated for all the time intervals studied.

The concentrations at which the NSAIDs showed significant cytotoxicity were selected for further experiments to study synergistic effects. The concentrations are mentioned in parenthesis. Tolfenamic acid (100 μM), naproxen (75 μM), ibuprofen (60 μM), diclofenac (100 μM), celecoxib (100 μM) and curcumin (25 μM).

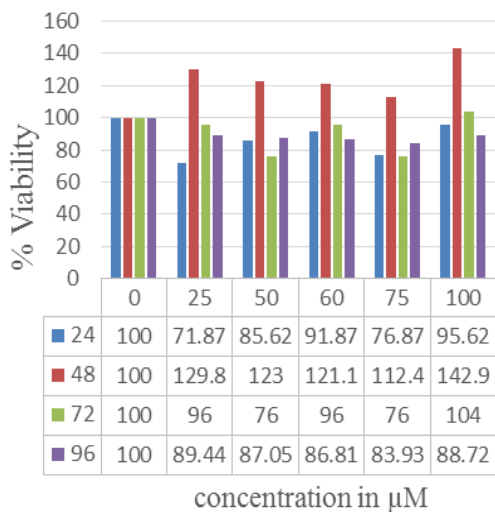


Graph 1: % viability against tolfenamic acid.

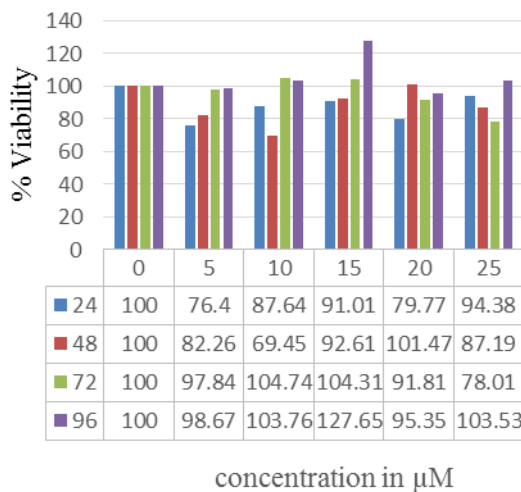
Graph 2: % viability against ibuprofen.



Graph 3: % viability against diclofenac.



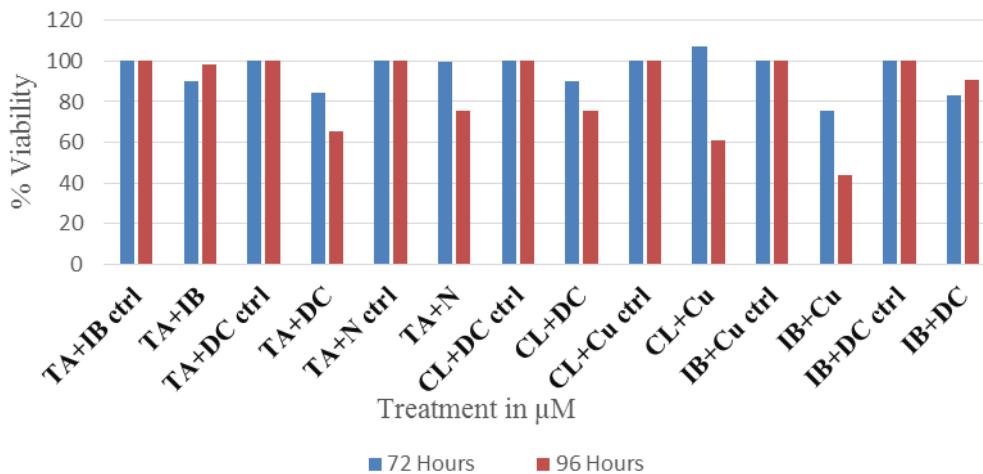
Graph 4: % viability against celecoxib.



Graph 5: % viability against naproxen.

Graph 6: % viability against curcumin.

Furthermore, the selected NSAIDs and curcumin were tested in different combinations of 2, 3, 4 and 5 together (depicted in graphs 7-10), to assess the synergistic effect. Table 1 indicates the results of the combination treatment administered. The The two NSAIDs combination treatment tested for 72 and 96 hours, yielded IB+CU as the most significant among all the combinations tested with cell viability at 44% for 96 hours incubation time.

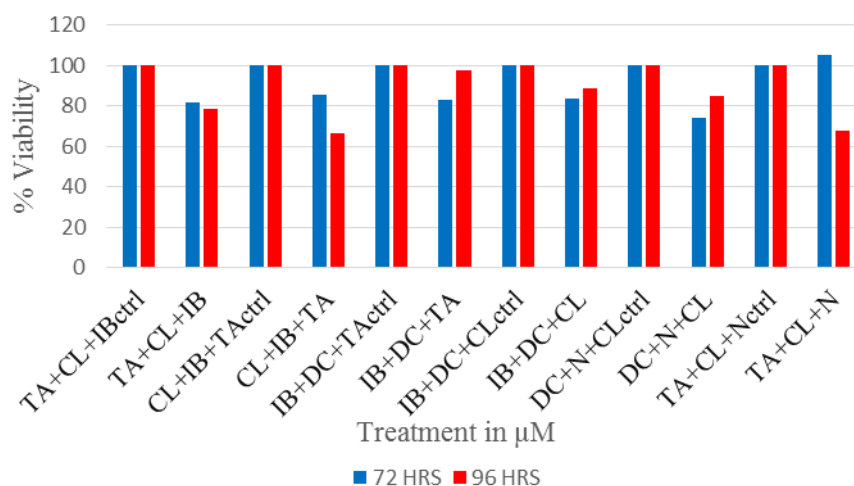


Graph 7: MTT assay combination of 2 drugs.

TA: (Tofenamic Acid); IB: (Ibuprofen); CL: (Celecoxib); N: (Naproxen); DC: (Diclofenac)
CU: (Curcumin)

When cytotoxic synergistic effect was checked for 3 NSAIDs combination, the combination

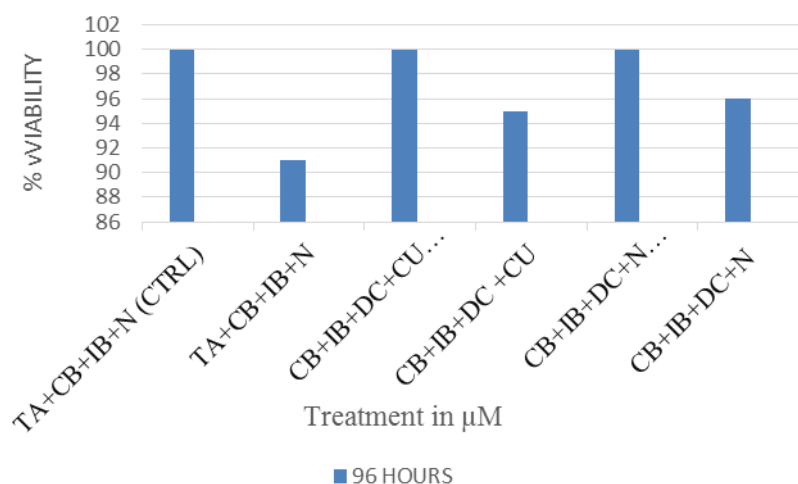
of IB+TA+CL indicated minimum % viability of 66% of all the combinations tested after 96 hours of treatment indicating that the combination gives maximum cytotoxicity against the A549 cell line. Whereas, TA+CL+N combination pointed to a 67% viability after 96 hours treatment.



Graph 8: MTT assay combination of 3 drugs.

TA: (Tofenamic Acid); IB: (Ibuprofen); CL: (Celecoxib); N: (Naproxen); DC: (Diclofenac)
CU: (Curcumin).

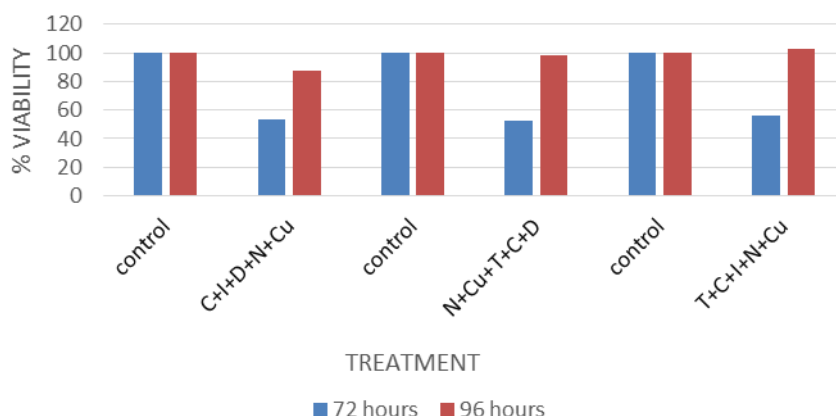
The treatment with 4 NSAIDs combination of tolfenamic acid with CL+IB+N, indicated 91% viability whereas, diclofenac in combination with CL+IB+CU showed 95% viability while naproxen in combination with CB+IB+DC showed 96% cell viability after 96 hours of treatment.



Graph 9: MTT assay combination of 4 drugs at 96 hour.

TA: (Tofenamic Acid); IB: (Ibuprofen); CB: (Celecoxib); N: (Naproxen); DC: (Diclofenac)
CU: (Curcumin).

The combination of 5 NSAIDs T+CL+I+DC+CU indicated 45.3% viability of all the combinations tested after 72 hours of treatment. Naproxen in combinations with CL+I+DC+CU indicated 53.1% and 88% viability after 72 hours and 96 hours incubation respectively.

**Graph 10: MTT assay combination of 5 drugs.**

T: (Tofenamic Acid); I: (Ibuprofen); C: (Celecoxib); N: (Naproxen); D: (Diclofenac) CU: (Curcumin).

Table 1: Synergistic % Viability of selected NSAIDs and Curcumin treatment administered on A549 Lung cancer cell line.

Time of Incubation	% Viability		Best outcome
	72 hours	96 hours	
Two NSAIDs Combination Treatment			
ssssIB+CU	76%	44%	IB+CU
TA+IB	90%	98%	
TA+DC	84%	66%	
TA+CL	175%	78%	
TA+N	100%	76%	
CL+DC	90%	76%	
CL+CU	107%	61%	
Three NSAIDs Combination Treatment			
TA+CL+N	105%	67%	TA+CL+IB+N
N+ DC+TA	90%	145%	
N+ DC+CL	74%	85%	
TA+ CL+IB	82%	78%	

TA+CL+CU	113%	70%	
IB+TA+CL	85%	66%	
IB+CL+CU	90%	107%	
IB+DC+TA	83%	97%	
IB+DC+CL	84%	89%	
DC+IB+CU	133%	90%	
DC+N+IB	148%	78%	
N+CL+IB	111%	89%	
Four NSAIDs Combination Treatment			
TA+CL+IB+N	-	91%	TA+CL+IB+N
DC+CL+IB+CU	-	95%	
N+CB+IB+DC	-	96%	
Five NSAIDs Combination Treatment			
T+CL+I+DC+CU	43.5%	102%	N+CL+I+DC+CU
N+CL+I+DC+CU	53.1%	88%	
TA+N+CL+DC+CU	52.1%	98.6%	
IB+T+CL+N+CU	56.4%	102%	

T: (Tolfenamic Acid); I: (Ibuprofen); C: (Celecoxib); N: (Naproxen); D: (Diclofenac)
CU: (Curcumin)

Tolfenamic acid showed viability of 52.1% in combinations with N+CL+DC+CU after 72 hours of incubation. Whereas, Ibuprofen showed 56.4% viability in combinations with T+CL+N+CU after 72 hours of incubation. Table 1 also indicates the best outcomes for combination of NSAIDs tested.

Table 2 represents the analysis of docking studies performed. The interactions of cyclooxygenase 1 and cyclooxygenase 2 with NSAIDs viz., tolfenamic acid, diclofenac, naproxen, celecoxib & ibuprofen and curcumin with respect to the binding energy and type of interactions is represented here. Standard Chemotherapeutic agents (Etoposide, Irinotecan, Paclitaxel) were docked and the results obtained provide a comparative insight into the potency of selected inhibitors (NSAIDs) and standard chemotherapeutic drugs through analysis of their binding capacities. Binding energy should be ideally negative. More the binding energy, better the affinity of ligand and the protein. On comparing the selected NSAIDs and standard Chemotherapeutic agents, tolfenamic acid and irinotecan were found to have lowest binding energies with Cyclooxygenase 1 and Cyclooxygenase 2, which means that the drugs have high affinity for COX-1 and COX-2. From the binding energies of NSAIDs and Curcumin, Curcumin was found to have lower binding energy which means that Curcumin have higher affinity for COX-1 and COX-1 than NSAIDs.

Table 2: Docking analysis of standard anticancer drugs, selected NSAIDS and curcumin

with cox-1 and cox-2.

Ligand	CYCLOXYGENASE 1		CYCLOXYGENASE 2	
	Binding Energy	Interacting Sites	Binding Energy	Interacting Sites
Tolfenamic acid	-8.82	Asn 381, His 385 Tyr 384	-8.56	Asn 375, Asn 376
Ibuprofen	-7.56	Trp 386	-6.96	Asn 537, Val 228 Gly 533
Diclofenac	-7.78	Asn 381, Tyr 384 His 206	-8.08	Gly 225, His 226 Val 228, Asn 375
Naproxen	-8.23	Met 390, Trp 386 Asn 381	-7.96	Val 228, Asn 537
Celecoxib	-6.94	Tyr 403, His 387	-8.44	Gln 374, Arg 376
Curcumin	-8.81	His 387, His 385 Gln288T p386 Thr 205, His 205	-10.05	Gln 374, Gly 533 Val 228, Asn 537 Trp 139, Asp 229
Standard Chemotherapeutic Agents	Dock Score		Dock score	
Etoposide	-10.35		-12.45	
Irinotecan	-13.23		-13.73	
Paclitaxel	-7.39		-11.45	

CONCLUSION

The modern targeted therapies and various techniques are effective in lung cancer management, but they often cause numerous side effects. This study is beneficial in developing non-invasive cancer management modalities. The present study aimed at investigating the effect of NSAIDs on lung cancer A549 cell line and the augmentation of cytotoxicity by curcumin. The cytotoxic effects were tested by MTT assay and their interaction with the target molecules (COX-1 and COX-2) were analysed by *in silico* studies using Molecular Docking. Our study shows that NSAIDs Tolfenamic acid and ibuprofen in combination with other NSAIDs and curcumin show reduced viability of lung cancer A549 cells. Also, the docking studies and its analysis corroborat that tolfenamic acid and curcumin have higher binding affinity for COX-1 and COX-2. It can be said that, augmentation of NSAIDs by Curcumin has increased the cytotoxic activity as compared to the standard chemotherapeutic agents. This indicates that tolfenamic acid and curcumin can be good cytotoxic drugs for lung cancer management. The combinations with curcumin and tolfenamic acid could be used as supplement therapeutic agents after due validation.

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STUDY THE PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AND ITS ASSOCIATED FACTORS IN THE POPULATION OF KACHIPURA (INDIA)

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Authors TW and PH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author SP managed the analyses of the study. Author VU managed the literature searches and helped in revision of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Hepatitis B virus infection (HBV) is a global public health problem. Nearly two billion people in the world have been acutely infected by HBV and there are nearly 350 million people chronically infected with HBV. In this research study Population based hepatitis survey was carried out to estimate sero-prevalence of hepatitis B virus (HBV) infection for the Kachipura population which is located in Nagpur Dharampeth area (India). Random sampling of population has been done. Oral consent was taken before taking blood sample. The selected population could answer the questionnaire. All age group people are selected for sampling. Prevalence of hepatitis B surface antigen and its associated factors in Kachipura population has been studied. Also study the relation between hepatitis B positive and various symptomatic characteristics. Effect of various risk factor like drug abuse, food habits have been studied. Blood samples were taken and serological analysis of collected blood samples has been done using HBsAg kit. Data were analyzed using standard biostatistician tool and software SPSS. 1.86% of prevalence rate of hepatitis B viral infection has been found in the population of Kachipura. Relation between blood groups and HBsAg positive has been found that the people with ORh+ve blood group are very prone to Hepatitis B infection.

Keywords: Kachipura; hepatitis; serotyping; HBV; liver disease.

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1. INTRODUCTION

Hepatitis B virus (HBV) infection is still a major public health problem worldwide [1]. HBV is small DNA virus belonging to family Hepadnaviridae [2]. Hepatitis B virus is a hepatotropic deoxyribonucleic acid (DNA) virus which occurs through immune mediated killing of infected liver cell. It is also recognized as oncogenic virus that can cause a higher risk of developing hepatocellular carcinoma [3]. It is 50 -100 times more infectious than HIV [3]. Hepatitis B virus infection is life long, causing cirrhosis, liver cancer, liver failure and death. It can be acute with discrete onset of symptoms and jaundice or elevated serum ALT > 100 IU/L or chronic with no symptoms [3]. HBV is transmitted via permucosal or percutaneous exposure to infected body fluids or blood products and it replicates vial an RNA intermediate that can integrate itself into host genome [2]. Around 90% of infants infected prenatally become chronic carriers, unless vaccinated at birth. Approximately 25% of person who becomes chronically infected during childhood and 15% of person chronically infected after childhood die of cirrhosis of liver cancer [4]. Rate of chronicity is approximately 5% in adult infection, but it reaches 90% in neonatal infection. More than 300 million people have chronic liver infection globally and 600,000 people die annually from acute or chronic complication of hepatitis B infection [3].

HBV infection during pregnancy is closely related to high risk of maternal complication including pre-eclampsia, placenta previa, preterm delivery, placental separation, ante partum hemorrhage, preterm labour, increased incidence of intraventricular hemorrhage, gestational diabetes mellitus and mortality with high rate of vertical transmission leading to fetal and neonatal hepatitis. Transmission from mother to infant take place in uterine, during delivery and after birth. Children born to HBs Ag + and hepatitis e antigen (HBeAg+) mother have 70-90% chance of prenatal acquisition of HBV infection and over 85-90% of them will eventually become chronic carries of the disease. They are main reservoirs for continued transmission of HBV and have high risk of hepatocellular carcinoma and liver cirrhosis [3].

Hepatitis B can be transmitted vertically from mother to child or horizontally by infected blood or by sexual intercourse [5]. High risk of transmission by infected blood is associated with the following medical and non-medical procedure:-

1. Blood products and whole blood transmission.
2. Surgical and microsurgical procedures.
3. Hemodialysis.

4. Intravenous drug application.
5. Accidental puncture with infected blood.
6. Accidental contact with infected blood.
7. Tattoo or piercing cosmetic procedures.
8. Manicure and pedicure.
9. Shared use of razor or toothbrush or nail cutter [6].

India is mesoendemic for HBV. Hepatitis B surface antigen (HBsAg) positivity in the general population ranges from 2.4% (2.2–2.7) and among tribal population 15.9% (11.42-20.4). Although predominate mode of transmission is horizontal, vertical transmission also placed a significant role in India [7]. Based on the prevalence of Hepatitis B surface antigen, different areas of the world are classified as high ($\geq 8\%$), intermediate (2-7%) or low HBV endemicity. India falls under the category of intermediate endemicity zone (average of 4%). Since India has one-fifth of the world's population, it accounts for a large proportion of the worldwide HBV burden. India harbours 10-15% of the entire pool of HBV carriers of the world. It has been estimated that India has around 40 million HBV carriers. About 15-25% of HBsAg carriers are likely to suffer from cirrhosis and liver cancer and may die prematurely. Chronic HBV infection accounts for 40-50% of hepatocellular carcinoma (HCC) and 20-30% cases of cirrhosis and chronic HCV infection accounts for 12-32% of HCC and 12-20% of cirrhosis in the country [8].

India falls into the category of intermediate endemicity for HBV and the common genotypes reported from India are A followed by D. In a population-based study conducted by Chowdhury et al., 7653 subjects were screened and 2.97% tested positive for HBsAg, of whom majority (90%) were Hepatitis B e antigen (HBeAg) negative and Hepatitis B e antibody (anti-HBe)- positive. A study by Lodha et al. from New Delhi depicted the prevalence of HBV infection in India to be 1–2% [9].

A well designed meta-analysis by Batham et al. noted a high prevalence of HBV infection in the tribal population of India (15.9%) when compared to the non-tribal population (2.4%). However, in order to overcome the fallacy of publication bias which can distort the results drawn in systematic reviews, the authors used population-weights and estimated a prevalence of HBV infection to be 3.07% in the non-tribal population when compared to 11.85% in the tribal population. Few other studies have assessed the prevalence of HBV infection in the tribal population of India and have noted prevalence ranging from 4.4% in the Baiga tribal population of Madhya Pradesh to 37.8% in the Shompen tribe and 65% in

the Jarawa tribe of Andaman and Nicobar islands. Due to the bias of self-selection, screening blood donors usually underestimates the real prevalence of HBV in a community and most of the blood bank data from India depict a prevalence of HBV infection of about 0.2–4% [10].

The predominant mode of transmission of HBV in India is horizontal [11], although a recent study by Dwivedi et al. has shown 56.8% of pregnant women with HBV infection to be in the high replicative phase and having HBeAg positivity, suggesting vertical transmission to play a significant role in India as well. The prevalence of HBsAg positivity in antenatal women was noted to be 0.9% in this study [12].

2. MATERIALS AND METHODS

Present research study carried out with the prior permission of ethical committee of the Dr. Ambedkar College, Deekshabhoomi. Nagpur. Laboratory analysis completed in the Department of Biochemistry and Biotechnology, Dr. Ambedkar College, Deekshabhoomi Nagpur during the Month of February 2020.

2.1 Study Area and Period

A cross sectional sero-epidemiologic study of hepatitis B surface antigen and its associated factor in population of Kachipura in Nagpur city, India was conducted in the month of February 2020. Kachipura comes under Dharampeth area ward 82 area is 3.6 hectares, household 400, slum code 104, population is 2000, located in major part of Nagpur the nearby areas consist of hospitals like KRIMS and sunflower, parks-Kachipura park, lendhra park, kotak Mahindra bank, lendhra market etc.

2.2 Selection of Population

Source population were of all age group stays in Kachipura during the period of survey fulfil the selection criteria all people who can be test by the HBsAg kit are inclusion criteria and the people who drinks alcohol and other drug abuse and the people who are present with symptomatic characteristics and who are unable to answer the question were excluded from the study.

2.3 Sample Size and the Sampling

Total 322 individuals were considered by simple random sampling method for this research study and the sample size determine by the single population proportional formula with the assumption of 95% confidence interval, finally calculated sample size was 322 from total population 2000[13-14].

2.4 Data Collection

A self-administered English Version Questionnaire was used to collect data related to Socio-demographic characteristics and associated risk factors and symptomatic characteristics for HBV infection were collected using structured questionnaire by trained health care professionals the study variables included in the study were age, sex, education, occupation, food habits, medical facilities in Kachipura, regular hospital visits, water facilities, any drug abuse, blood donation, blood transfusion, ever suffered from jaundice, dark urine, pale stool, abdomen pain, liver check-up, immunity, cold cough fever, acidity, lose motion, constipation, pregnancy, hepatitis B status and blood group. Data collection from participants was facilitate by laboratory professional for blood collection [15-17].

2.5 Detection of HBsAg

Two milliliter of venous blood was collected from study participants by trained laboratory technologist serum was separated by centrifugation at 4000 rpm for 10 minutes. Each serum was subjected to HBsAg antibody rapid test (Oscar Medicare Private Limited, India). OSCAR rapid test kit is qualitative, solid phase, two-site sandwich immunoassay for detection of HBsAg in serum HBV infection status was defined by positive and negative result for HBsAg using HBsAg test strip[18].

2.6 Data Quality Assurance

To ensure the quality of data, questionnaire was prepared in English language and translated it into Hindi and Marathi language as per the convenience of participants. To make sure that the questionnaire is appropriate and understandable. It was pretested and training was given for supervisor and data collectors for 1 day. The data collection process was supervised and collected data were reviewed and completeness by the principal investigator. Then the collected data were checked for consistency and accuracy. Standard operating procedures were strictly followed during blood sample collection, storage and analytical process. Storage conditions and expired date of reagents were checked. Positive and negative control sera were run following the manufacturer recommendation of the kit [19-20].

2.7 Data Analysis

Collected data were checked for the completeness and consistency and coded manually. Then data were entered into Epidata version 3.1 and cleaned data were exported to SPSS version 21 windows to recode, compute and do other statistical analysis. In the univariate analysis a descriptive statistical was

conducted to explore frequency distribution, central tendency, variability (dispersion) and overall distribution of independent variables [21].

Bivariate logistic regression analysis was conducted to select candidate variable for multivariable analysis. All explanatory variable associated with the outcome variable in bivariate analysis with p-value of <0.25 were included in logistic models of multivariable analysis using backward stepwise method. Adjusted odd ratio along with 95% confidence interval was used to check the strength of association. Multicollinearity between the independent variable was checked using variance inflation factor. Finally model fitness was done using Hosmer and Lemeshow statistics, chi-square ($\chi^2=1.82$) and p-value was 0.61. Variable with p value < 0.05 were considered as statistically significant. Confidence interval of outcome variable was (95% CI: 4.7-11.9) [22-23].

3. RESULTS

Quantitative data of Hbsag prevalence with respect to age, affecting factors and blood group presented in Table 1A and Table 1B, Age group-wise prevalence of HbsAg in the population of Kachipura shown in Fig. 1.

4. DISCUSSION

The result of study shows that prevalence of HBsAg among Kachipura population was 1.86%. According to WHO criteria which classifies endemicity of HBV infection: low endemicity area (less than 2% seropositive), intermediate endemicity area (2% to 7%

seropositive) and high endemicity area (more than 8% seropositive), the result showed low endemicity area [24]. Kachipura is representative of Nagpur city in general because of most of inhabitant's earnings in middle of income range, sex and the age distribution, and the level of economic and cultural developments in province.

HBV infection is consider as major public health problem in India. According to the study among below 20 age group prevalence rate is 1%, among 20 to 60 age group prevalence rate is 2.26% and more than 60 prevalence rate is 2% (Fig. 1). Prevalence rate in particular blood group is found to be 22% in A +ve and 21% in AB +ve and 57% in O +ve. Prevalence rate found to be 0% in blood group in O -ve.

Rate of prevalence among symptomatic characteristics study found to be 2.89% among male, 1.08% in female. 1.61% prevalence rate found in educated people 0.88% among employed population 2.49% among fast food eaters, 2.05% among non-vegetarian, 1.97% among NMC water drinkers, 3.08% among population who does drug abuse, 5% found in jaundice suffered population, 3.92% among population who has abdomen pain, 1.28% among strong immunity people whereas 3.41% among weak immunity people, 1.86% among the people who has indigestion issues (Table 1). In Kachipura there is no medical facilities available people does not visit hospital for regular checkup. People rarely go for blood transfusion and blood donation. Only one family among the population is aware of hepatitis B and other does not know about the disease, its risk factor and symptomatic characteristics.

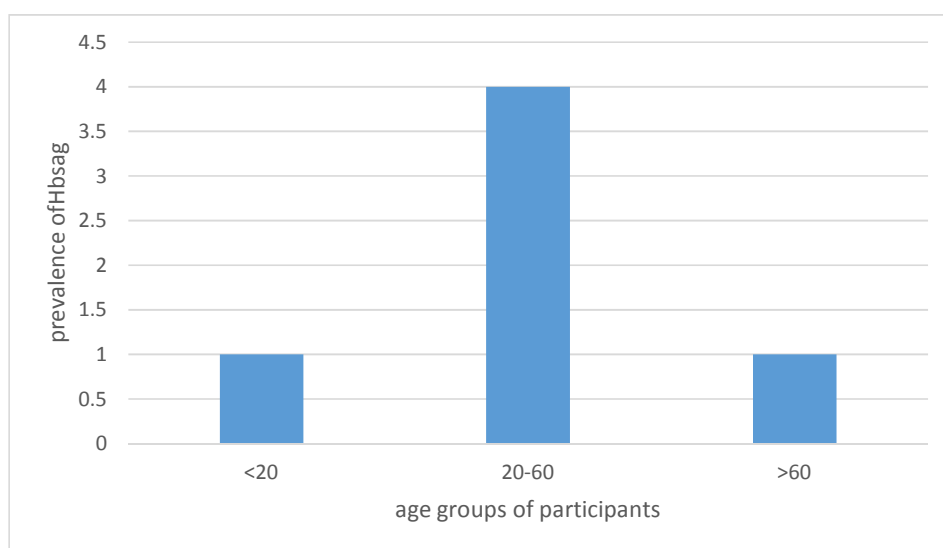


Fig. 1. Age group-wise prevalence of HbsAg in the population of Kachipura (Nagpur)

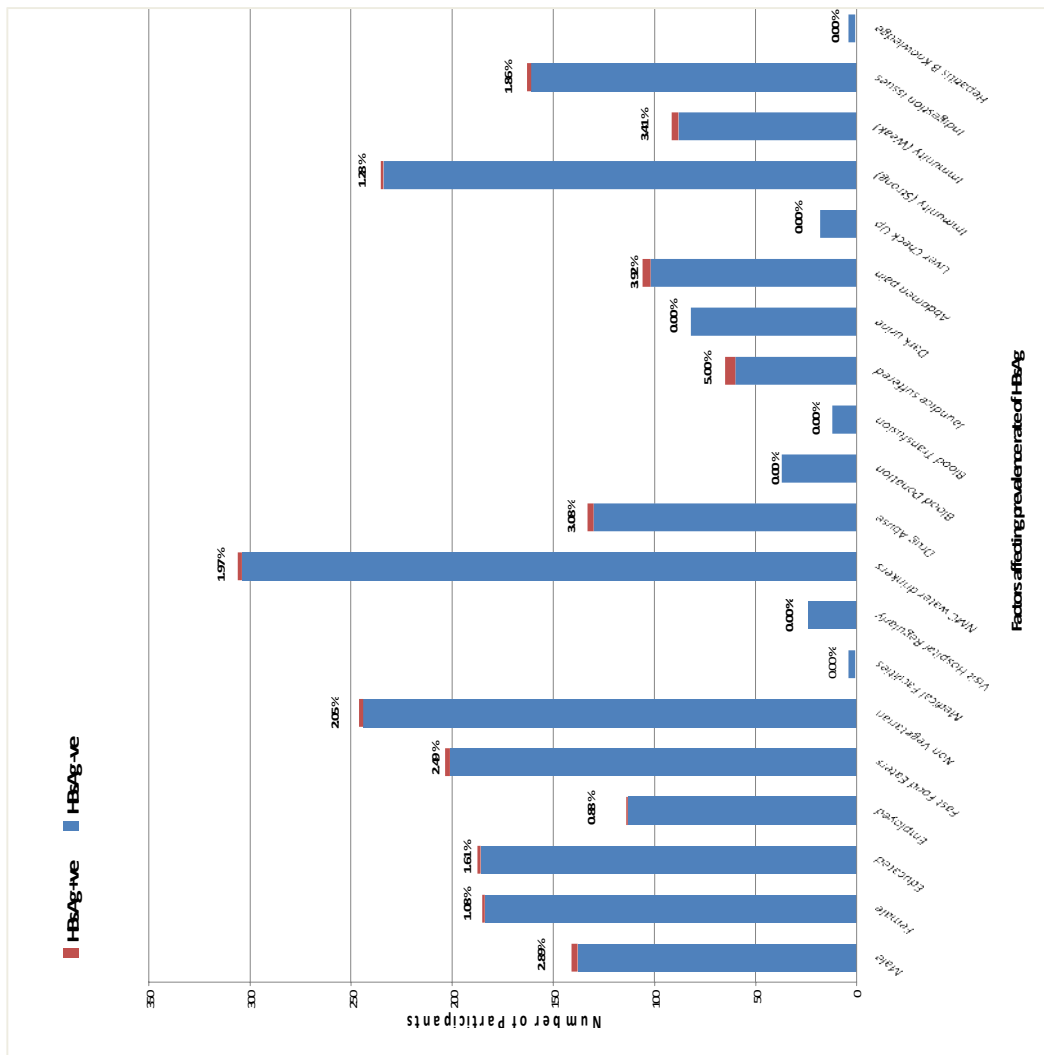


Fig. 2. Distribution of participants according to factors affecting prevalence of HBsAg

The knowledge of region and age specific prevalence of hepatitis B infection is important for evaluating vaccination program and national disease prevention and control efforts are finding classify the region as having low HBV endemicity rather than intermediate high endemicity defined by previous study in the last century and past decade. Introduction of vaccination in this regions happened in different year and in different age group [25].

Vaccination program for all new borns should be continued susceptible adult whose HBV markers are all negative should have repeat checkup immunization, especially those individuals who have risk factors of having poor sleep quality, being private small businessmen, having a family history of HBV,

having no personal history of vaccination and being a young male adult. HBV carries need to be closely monitor or treated. The finding of current study at to the knowledge of hepatitis B epidemiology in the area with a sizable high risk group, demonstrating the importance of screening programs for hepatitis B. mass screening permits base line estimates of prevalence and provide insight into the appropriate vaccination strategy. Furthermore because of India's high incident of hepatitis B related hepato-cellular carcinoma, screening programs are clinically significant for facilitating referral of newly diagnose cases to appropriate medical care [26]. Presently, In India there is COVID Pandemic spread globally and mainly in India affecting socio-economic and health of the global population [27, 28].

Table 1A. Quantitative data of Hbsag prevalance with respect to age, affecting factors and blood group

Characteristic	Frequency	Male						Female					
		Male	Female	Hbsag +ve	Symptomatic	Non Symptomatic	Hbsag -ve	Hbsag +ve	Symptomatic	Non Symptomatic	Hbsag -ve		
Age Group	< 20	96	46	50	1	1	0	45	0	0	0	50	
	20-60	177	70	107	3	2	1	67	1	1	0	106	
	60 +	49	22	27	0	0	0	22	1	1	0	26	
Personal Information Parameters related to prevalence of Hepatitis B	Educated	186	83	103	2	1	1	81	1	1	0	102	
	Employed	113	79	34	0	0	0	79	1	1	0	33	
	Fast Food Eaters	201	93	108	4	3	1	89	1	1	0	107	
	Non Vegetarian	244	121	123	3	3	0	118	2	2	0	121	
	Medical Facilities	5	5	0	0	0	0	5	0	0	0	0	
	Visit Hospital Regularly	24	5	19	0	0	0	5	0	0	0	19	
	NMC water drinkers	304	126	178	4	3	1	122	2	2	0	176	
	Drug Abuse	130	89	41	2	2	0	87	2	2	0	39	
	Blood Donation	37	29	8	0	0	0	29	0	0	0	8	
	Blood Transfusion	12	3	9	0	0	0	3	0	0	0	9	
	Jaundice suffered	60	24	36	2	1	1	22	1	1	0	35	
	Dark urine	82	31	51	0	0	0	31	0	0	0	51	
	Abdomen pain	102	48	54	3	3	0	45	1	1	0	53	
	Liver Check Up	18	7	11	0	0	0	7	0	0	0	11	
	Immunity (Strong)	234	92	142	1	0	1	91	2	2	0	140	
	Immunity (Weak)	88	46	42	3	3	0	43	0	0	0	42	
	Indigestion Issues	161	59	102	2	2	0	57	1	1	0	101	
	Hepatitis B Knowledge	5	5	0	0	0	0	5	0	0	0	0	
Blood Group	A +ve	53	23	30	1	0	1	22	0	0	0	30	
	B +ve	125	58	67	0	0	0	58	0	0	0	67	
	AB +ve	54	26	28	0	0	0	26	1	1	0	27	
	O +ve	82	29	53	3	3	0	26	1	1	0	52	
	A -ve	0	0	0	0	0	0	0	0	0	0	0	
	B -ve	6	2	4	0	0	0	2	0	0	0	4	
	AB -ve	0	0	0	0	0	0	0	0	0	0	0	
	O -ve	2	0	2	0	0	0	0	0	0	0	2	

Table 1B. Quantitative data of Hbsag prevalence with respect to age, affecting factors and blood group

	Characteristic	Frequency			Total		Symptomatic	%	Non Symptomatic	%	Hbsag -ve
			Male	Female	Hbsag +ve	%					
Age Group	< 20	96	46	50	1	1.04	1	1.04	0	0	95
	20-60	177	70	107	4	2.26	3	1.69	1	0.56	173
	60 +	49	22	27	1	2.04	1	2.04	0	0	48
Personal Information	Educated	186	83	103	3	1.61	2	1.08	1	0.54	183
	Employed	113	79	34	1	0.88	1	0.88	0	0	112
Parameters related to prevalence of Hepatitis B	Fast Food Eaters	201	93	108	5	2.49	4	1.99	1	0.50	196
	Non Vegetarian	244	121	123	5	2.05	5	2.05	0	0	239
	Medical Facilities	5	5	0	0	0.00	0	0.00	0	0	5
	Visit Hospital Regularly	24	5	19	0	0.00	0	0.00	0	0	24
	NMC water drinkers	304	126	178	6	1.97	5	1.64	1	0.33	298
	Drug Abuse	130	89	41	4	3.08	4	3.08	0	0	126
	Blood Donation	37	29	8	0	0.00	0	0.00	0	0	37
	Blood Transfusion	12	3	9	0	0.00	0	0.00	0	0	12
	Jaundice suffered	60	24	36	3	5.00	2	3.33	1	1.67	57
	Dark urine	82	31	51	0	0.00	0	0.00	0	0	82
	Abdomen pain	102	48	54	4	3.92	4	3.92	0	0	98
	Liver Check Up	18	7	11	0	0.00	0	0.00	0	0	18
Immunity (Strong)	234	92	142	3	1.28	2	0.85	1	0.43	231	
Immunity (Weak)	88	46	42	3	3.41	3	3.41	0	0	85	
Indigestion Issues	161	59	102	3	1.86	3	1.86	0	0	158	
Hepatitis B Knowledge	5	5	0	0	0.00	0	0.00	0	0	5	
Blood Group	A +ve	53	23	30	1	1.89	0	0.00	1	1.89	52
	B +ve	125	58	67	0	0.00	0	0.00	0	0	125
	AB +ve	54	26	28	1	1.85	1	1.85	0	0	53
	O +ve	82	29	53	4	4.88	4	4.88	0	0	78
	A -ve	0	0	0	0	0.00	0	0.00	0	0	0
	B -ve	6	2	4	0	0.00	0	0.00	0	0	6
	AB -ve	0	0	0	0	0.00	0	0.00	0	0	0
	O -ve	2	0	2	0	0.00	0	0.00	0	0	2

5. CONCLUSION

Study of socio demographic characteristics, risk factor and symptomatic characteristics associated with HBV infection done thoroughly. Strong association between HBV infection and ABO blood grouping was found and also association with immunity was observed regarding the gender, occupation, personal history of vaccination and age in adults. There has been decrease in prevalence of HBV infection since the national expanded program of immunization. Mother to fetal vertical transmission of HBV is well controlled. Transmission between adult has become most common mode of HBV spread. While survey focus on Kachipura region of Nagpur but it is likely that similar results were found else were in the country. Identifying groups at risk for susceptibility can assist in the development of national strategies to target specific group for cost effective salvage vaccination program for adulating the future.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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**EFFECTS OF HEAVY METALS ON SEED GERMINATION AND EARLY
SEEDLING GROWTH OF MARIGOLD PLANTS SPECIES**

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Abstract:

Rapid industrialization, urbanization processes and poor management of industrial effluent has led to the incorporation of pollutants such as pesticides, petroleum products, acids and heavy metals in the natural resources like soil, water and air thus degrading not only the quality of the environment, but also affecting both plants and animals. Seed is a developmental stage that is highly protective against external stresses in the plant life cycle. Seed germination, seedling development and its growth rate play a key role in phytoremediation and plants have evolved strategies to combat heavy metal stress. A few studies have reported the genetic and biochemical elements in plants helping them overcome heavy metal stress so that the present study was conducted to determine the effect of Cu, Ni, Pb and Cr on seed germination and seedling growth of marigold plant species *Tagetes erecta* and *Calendula officinalis*. Both the plant species were germinated in soil containing metal concentration ranges from 50-400 mg/kg of soil. Our results showed that when increased the concentration of Cu, Ni, Pb and Cr specifically above 100 mg/kg decreased in the percentage of seed germination, seedling growth and increased in the time of seed germination in both species of marigold as compared to control pot. This study showed that the both species of marigold very well tolerate to high concentration of metal upto 100 - 300mg/kg in soil. The highest germination percentage as well as seedling growth of both species was estimated in the pot containing lead, followed by nickel, copper and chromium.

Keywords: Heavy Metals, Metal toxicity, *Tagetes erecta*, *Calendula officinalis*

Introduction:

Environmental pollution caused by natural processes or anthropogenic activities is a major global problem. Environmental contamination has become a concerning issue worldwide due to number of risks it poses to human health and ecosystem functioning (Malik, 2017). Heavy metals can enter a water supply by industrial and consumer waste, or even from acidic rain breaking down soils and releasing heavy metals into streams, lakes, rivers, and groundwater. Evaluated heavy metals contaminated soils are widely spread and concerns have been raised over the potential risks to humans, animals and agriculture crops (Moraghebi, 2011). Heavy metals are great interest for research purpose with respect to toxicological importance to human health, plants and animals (Tchounwou PB, 2012). Excessive concentration of heavy metals viz., Cr, Cd, As, Ni, Se and Pb have been found in soils of agricultural land nearby cities, mines and industrial areas around the world (Dotaniya, 2016). The bioavailability of metals in soil is a dynamic process that depends on specific combinations of chemical, biological, and environmental parameters (Wati Ibnu Hajar, 2014).

In heavy metal polluted soils, plant growth can be inhibited by metal absorption. However, some plant species are able to accumulate fairly large amounts of heavy metals without showing stress, which represents a potential risk to animals and humans (Oliver, 1997). The level of plant tolerance to heavy metals is related to the balance between the rate at which metal ions are taken up and the efficiency with which they are detoxified within the plant. Thus the same amount of a metal present in plant tissues may be detrimental for one species while not at all for others (Wati Ibnu Hajar, 2014).

In this study two species of Marigolds were selected as they can grow in polluted areas and they can tolerate contaminant toxicity. Marigold plant species recently reported by various researcher for their heavy metal accumulation potential (Choudhury, 2015). So that present investigation taken to evaluate the effect of selected heavy metals like Cu, Ni, Pb, and Cr on seed germination, and seedling growth of marigold plant species *Tagetes erecta* and *Calendula officinalis*

Material and Methods:

Seed samples and chemicals: Seed samples of *tagetes erecta* and *calendula officencilis*. were purchased from Suman farms and garden pvt. Ltd. Nagpur, India. All metal salt were used in this study purchased from High media pvt. Ltd.

Soil collection and characterization: Soil was collected from garden of Dr. Ambedkar College, Deekshabhoomi. Nagpur (Maharashtra), India; at 10 cm to 20 cm deep surface by using soil sampler. Soil was dried, sieved through 2 mm screens and made ready to determine physical and chemical properties (Rahul Anand, 2015).

Determination of moisture content: 100 grams of soil was weighed with water contents and after that the soil sample was dried in the hot air oven and after proper drying the soil sample was weighed again and finally the moisture content of soil was calculated as mentioned below. Moisture content was determined by the ratio of the weight of water in the soil to the weight of dry soil and expressed in % (Estefan G, 2012)

Determination of pH: The pH of the soil is an important factor of determining the growth rate of plant because pH regulates nutrients availability in plant. 20 grams weighed soil was placed into 100 ml polyethylene beakers and 40 ml water was added to make a saturated paste. Then it was shaken for 2 hrs or was stirred well with glass rod and electrode was immersed in the suspension. pH was reading when reading was stabilized on pH meter (Harold, 1934).

Determination of Particle size: 40 g air-dry soil (2-mm) was weighed and 60-ml dissolving solution [(NaPO₃)₁₃ + (Na₂CO₃)] was added to this soil. A beaker was taken and covered with a watch glass, and left for overnight. Then Stir the suspension at high speed for 3 minutes using the stirrer. Stirring paddles was washed into a cup, and allow standing for 1 minute. Quantitatively suspension was move to a 1-L calibrated a cylinder (hydrometer jar),

and bring to volume with water. Then suspension was poured through a 50 µl sieves to determine the sand clay and slit (Rahul Anand, 2015).

Determination of Electrical Conductivity: The same soil suspension prepared for Determination of pH was used for conductivity determination. After soil pH was recorded allow the soil suspension in the beaker to settle for maximum of ½ hours. The conductivity and 20 ml distilled water and 4 ml of reagent B was added. OD was taken on spectrophotometer after 10 minutes and value was calculated against the standard curve (Olsen S.R. and Sommers L.E. Phosphorous, 1982).

Determination of Potassium: 5 gm soil was placed in a 150 ml flask and 25 ml of neutral N ammonium acetate was added. After shaking for 5 minutes filter the solution to Whatman no. 1 filter paper. First few ml. of the filtrate was rejected. A solution was mixed and concentration of K was estimated by the flame photometer (Manohar, 2012) .

Determination of Nitrogen content in soil : 5g of soil was taken in a digestion tube and little water was added into it. Then 20 ml. of 0.32% KMnO₄ solution was taken and added to sample and fit the tube in the distillation unit. 20 ml of 2.5% NaOH solution was added through the distyl-em-dosing pump. Then 20 ml. of 2.5% of boric acid was pipette out in a conical flask and clip the receiving end of the distyl-em in it. From the tube distil ammonia gas was collected in the received acid. 5 drops of mixed indicators were added and was titrated with 0.02N H₂SO₄. Blank correction (without soil) was to be made for final calculations (Rahul Anand, 2015).

Experimental Pots Preparation, Sowing and Cultivation of Plants: Equal quantity of soil (1kg) was taken in a rectangular container aluminum foil (15/20 cm) and various Concentration of different metal salt of copper (Copper Sulphate), Nickel (Nickel Chloride), lead(lead II acetate trihydride), chromium(chromium trioxide) was added in the experimental aluminum container separately (table no. 1). A triplicate of each respective metal salt concentration was prepared. These metals were properly mixed with soil. 10 seeds of each species of tagetes plant were sown with each metal treated and control soil pots separately .These pots were kept in green houses properly, regularly irrigated and observed daily to determine seed germination percentage and length of seedling .

Table. No. 1. Various concentration of selected metals used in this study

Metals	Control	1	2	3	4	5
Copper	00	50	100	200	300	400
Nickel	00	50	100	200	300	400
Lead	00	50	100	200	300	400
Chromium	00	50	100	200	300	400

Result and Discussion:

Physiochemical analysis of soil: Soil analysis: Soil was collected from garden of Dr. Ambedkar College, Deekshabhoomi. Nagpur (Maharashtra), India. The various physical properties of soil were examined and mentioned in Table-2. In this study pH of the soil was 7.2. Therefore, this pH value was suitable for metal ions uptake by plants. The various chemical properties of soil were determined and the values were shown in table-2.

Effect of metals on seed germination and seedling growth:

In this investigation carried out the effect of copper, nickel, lead, chromium metals on seed germination and seedlings growth of marigold species *Tagetes erecta* and *Calendula officinalis* and result obtained in this study presented in table no.3-6. Results of pot experiments showed that when increased the concentration of Cu, Ni, Pb and Cr decreased in the percentage of seed germination, seedling growth and increased in the time of seed germination in both species of marigold as compare to control pot.

Copper showed similar effect on seed germination of both species of marigold but seedling growth of *Calendula officinalis* less affected as compare to *Tagetes erecta* (table-3). Copper (Cu) has been reported to be toxic to sunflower seedlings inducing oxidative stress via generation of reactive oxygen species (ROS) and by decreased catalase (CAT) activity via oxidation of protein structure. Cu stress leads to reduced germination rate (Pena LB, 2011) (Sfaxi-Bousbih A, 2010)

Nickel (Ni) is reported to be toxic to most plant species affecting amylase, protease and ribonuclease enzyme activity thus retarding seed germination and growth of many crops. It has been reported to affect the digestion and mobilization of food reserves like proteins and carbohydrates in germinating seeds (Ahmad MS, 2011) in our study also observed similar effect of Nickel on both *Tagetes erecta* and *Calendula officinalis* (table-4). In this study lead also shows negative effect on seed germination, seedling growth and delay in germination on both species *Tagetes erecta* and *Calendula officinalis* (table-5). Chromium showed highest negative effect on *Tagetes erecta* and *Calendula officinalis* against seed germination as well as seedling growth and significantly changes observed in germination period as compare to control (table-6). The highest germination percentage as well as seedling growth of both species was estimated in the pot containing lead, followed by nickel, copper and chromium.

Table- 2: Physiochemical properties of soil

Sr.No.	Parameters	Result
1	pH of the soil	7.2
2	Moisture Content	18.34 %
3	Electrical Conductivity	0.51 ds/m
4	Particle Size	0.6 mm
5	Phosphorous Content	184.0 Kg/ha
6	Nitrogen Content	101 kg/ha
7	Potassium Content	196 kg/ha

Table-3: Effect of Various Concentration of Copper on *Tagetes erecta* and *Calendula officinalis*

Pot No.	Metal conc, mg/kg	<i>Tagetes erecta</i>			<i>Calendula officinalis</i>		
		Germination %	Germination Time in Days	Mean Length of seedling after 4 week9(cm)	Germination %	Germination Time in Days	Mean Length of seedling after 4 week
1	Control	96.6	7	7.0	90.0	8	5.9
2	50	60.0	12	5.3	50.0	12	5.0
3	100	40.0	14	4.0	30.3	13	4.4
4	200	25.3	14	2.8	20.0	16	3.7
5	300	16.6	17	2.2	10.0	19	3.0
6	400	10.0	20	2.0	10.0	22	2.4

Table-4: Effect of Various Concentration of Nickel on *Tagetes erecta* and *Calendula officinalis*

Pot No.	Metal conc, mg/kg	<i>Tagetes erecta</i>			<i>Calendula officinalis</i>		
		Germination %	Germination Time in Days	Mean Length of seedling after 4 week(cm)	Germination %	Germination Time in Days	Mean Length of seedling after 4 week (cm)
1	Control	96.6	7	7.0	90.0	8	5.9
2	50	66.7	10	5.3	70.0	11	5.0
3	100	50.0	10	4.0	66.7	11	4.4
4	200	33.3	13	2.8	50.0	12	3.7
5	300	25.3	15	2.2	30.0	12	3.0
6	400	20.0	18	2.0	20.0	13	2.4

Table-5: Effect of Various Concentration of Lead on *Tagetes erecta* and *Calendula officinalis*

Pot No.	Metal conc, mg/kg	<i>Tagetes erecta</i>			<i>Calendula officinalis</i>		
		Germination %	Germination Time in Days	Mean Length of seedling after 4 week(cm)	Germination %	Germination Time in Days	Mean Length of seedling after 4 week
1	Control	96.6	7	7.0	90	8	5.9
2	50	80.0	9	5.5	83.4	10	4.6
3	100	76.6	9	4.6	80	10	4.3
4	200	63.4	12	3.9	70	10	3.7

5	300	40.0	13	2.4	63.4	12	2.6
6	400	30.0	14	2.3	40	13	2.4

Table-6: Effect of Various Concentration of Chromium on *Tagetes erecta* and *Calendula officinalis*

Pot No.	Metal conc, mg/kg	<i>Tagetes erecta</i>			<i>Calendula officinalis</i>		
		Germination %	Germination Time in Days	Mean Length of seedling after 4 week(cm)	Germination %	Germination Time in Days	Mean Length of seedling after 2 week
1	Control	96.6	7	7.0	90.0	8	5.9
2	50	50.0	16	4.6	30.0	15	2.7
3	100	30.3	18	3.1	20.0	21	2.2
4	200	20.0	21	2.9	16.6	24	1.5
5	300	10.0	24	2.0	10	26	1.3
6	400	10.0	27	1.3	6.6	28	0.8

Conclusion:

The study was carried out to evaluate the effect of the Cu, Ni, Pb, Cr on seed germination and seedling growth of *Tagetes erecta* and *Calendula officinalis* at all concentrations i.e. 50, 100, 200, 300 and 400 mg/Kg badly affected the germination period and partial decreased in germination percentage as well as growth of seedling. But both the species of marigold able to tolerate Cu, Ni, Pb, and Cr. in high concentration upto 300 mg/kg and able to grow in soil containing such a high concentration of toxic metals only period of germination badly affected. Hence it is suggested that the use of both *Tagetes erecta* and *Calendula officinalis* to understand the unknown molecular mechanisms by which germinating seeds combat heavy metal stress. The future scope of this study remains in understanding the biochemistry of heavy metal toxicity in germinating seeds.

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REVIEW ARTICLE

Metal/Metal Oxide Nanoparticles: Toxicity, Applications, and Future Prospects

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Abstract: The ever-growing resistance of pathogens to antibiotics and crop disease due to pest has triggered severe health concerns in recent years. Consequently, there is a need of powerful and protective materials for the eradication of diseases. Metal/metal oxide nanoparticles (M/MO NPs) are powerful agents due to their therapeutic effects in microbial infections. In this context, the present review article discusses the toxicity, fate, effects and applications of M/MO NPs. This review starts with an introduction, followed by toxicity aspects, antibacterial and testing methods and mechanism. In addition, discussion on the impact of different M/MO NPs and their characteristics such as size, shape, particle dissolution on their induced toxicity on food and plants, as well as applications in pesticides. Finally, prospective on current and future issues are presented.

Keywords: Metal oxide nanoparticles, toxicity, microbial assay, callus poisoning, pest control, plant biotechnology.

1. INTRODUCTION

Nanotechnology is a revolutionary technique that can resolve major problems faced by humans worldwide [1]. Novel applications of nanotechnology in energy generation, conversion and storage, optics, microelectronics, mechanical, and ceramics engineering are increasing day-by-day. Currently, metal/metal oxide nanoparticles (M/MO NPs) are gaining substantial attention in diverse fields of solid-state chemistry, owing to their unique physico-chemical properties [2, 3]. Nanomaterials (NMs) are being fabricated purposefully using numerous techniques, which exposed to the atmosphere with no safety measurement. Nanotoxicology is the study of NMs' toxicity, which is impacted by the NMs' small particle size, very large surface/volume ratio, as well as their ability to diffuse freely as compared to the bulky particles.

Several approaches, including chemical, thermal, physical and chemical vapored position, precipitation photo-deposition, sputtering, and pulsed electro-deposition, are used for the synthesis of M/MO NPs [4-9]. Various NPs are being already used in commercial applications, including food and agriculture, but they accumulate intracellularly and face difficulty in eliminating from living organisms and because of their toxicity, they could impact the ecosystem [10-13]. Therefore, the present review starts with an analysis of the noxious impacts of NPs on the environment and their contributions to cellular damage. The exposure to NPs through food and its impact are discussed. Applications of M and MO NPs on

agriculture are a growing field of research; the effect of different M and MO NPs on plants is analyzed. Further applications of M/MO NPs in pesticides are comprehensively discussed. Finally, conclusions and prospective on applications and impact of M/MO NPs are presented.

2. TOXICITY ASPECTS

M/MO NPs are heterogeneous in nature and their impact on living being rests on their size and shape other than the chemical behaviour of specific metal ion used [11]. Metals having a high dissolution rate are considered highly toxic, while other characteristics such as composition, concentration, morphology, particle dimensions, chemical reactivity, agglomeration, and dispersal directly affect their behaviour and interactions with surroundings [8]. Moreover, NPs liberated ionic species is among the main sponsors to noxiousness.

Moreover, surface charges dictate the interactions between NPs and cellular components. Aggregation helps particles to bond *via* the weak interactive forces and they are predominantly reliant on the charge, concentration and ingredients of the nearby environment. Agglomeration disturbs the bio-distribution plus interactions of NPs, when exposed to the cells. Agglomeration can be analysed by means of laser diffraction technique by measuring the *Brownian motion* in suspension and applying the *Stokes-Einstein* equation [12, 13]. The surface area and chemical composition of NPs are measured by *Brunauer-Emmett-Teller* (BET) adsorption-desorption behaviour under nitrogen. As the particle size declines, the relative surface area per unit mass inclines and as a consequence, the fraction of active atoms, those on the surface, increases, which can enhance toxic reactions [14]. Stable accumulation of NPs can remain energetic for a long time in the body. However, degradable NPs cause severe effects by releasing reactive oxygen species (ROS).

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2.1. NPs toxicity in Microbial Community

The properties of M/MO NPs are different than their bulk counterparts, due to the small size, diverse morphology, solubility, surface structure and aggregation [15]. These variances provide good functionalities for M/MO NPs. While, on the other hand, contribute to their negative impact on the environment and microbial community [15, 16]. Numerous studies emphasized on the exposure to M/MO NPs. It has been revealed that the NPs concentration is highest in soil compared to water and air, indicating that soil is the key for the engineered NPs liberated in the atmosphere [17, 18]. Nanowaste undergoes adsorption with carbon-based material and biomass, combined with other carbon materials or even undergo microbial conversion [19-20]. Endorsement of NPs by the pathogens might take place *via* diffusion, specific or non-specific uptake, or *via* membrane damage [18, 21, 22].

Reports on NPs interaction with microorganisms indicated that they bind with different biological matter and change their surface behaviour (Fig. 1a) *via* interruption of membrane-membrane potential, ROS production, oxidative damage to proteins, interference through electron transport or respiration, potential DNA damage and effects observed on the *gram-positive* species [21]. The definitive mechanism behind the microbial community is not clear, but possible mechanisms are (a) damage of cell membrane, (b) oxidation of protein molecules, (c) interaction with respiratory chain, (d) genotoxicity, (e) ROS reactive oxygen species, and apoptosis (Fig. 2) [23, 24].

Most of the toxicity studies focused on cellular level mechanism; however, far less data of molecular-level interactions of NPs are reported and metagenomic environmental sample survey leads to the study of NPs effects on microbial community shift in soil using techniques like quantitative PCR, 16S r-RNA and species sensitivity distribution method (SSD) [25, 26].

2.2. ROS Establishment

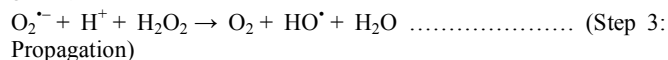
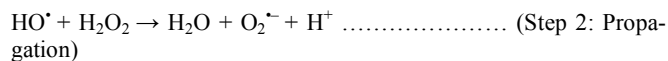
ROS is a cluster of active species formed in particular metabolic courses with oxygen participation. According to Haber-Weiss reaction, hydrogen peroxide (H_2O_2) and superoxide ($\bullet O_2^-$) catalysed by Metal ions produce hydroxyl radicals ($\bullet OH$). ROS is the main signalling molecules throughout cell signalling and homeostasis which are reactive species of molecular oxygen. ROS creates a pool of oxidative species comprising $\bullet O_2^-$ anion, $OH\bullet$ radical, H_2O_2 , singlet oxygen (O^2), and hypochlorous acid ($HOCl$). The ROS are produced intrinsically or extrinsically inside the cell. Molecular oxygen generates $\bullet O_2^-$, the primary ROS *via* one-electron reduction catalyzed using nicotinamide adenine dinucleotide phosphate (NADPH) oxidase. Additional, the oxygen reduction either leads to H_2O_2 or $OH\bullet$ *via* dismutation and metal-catalyzed Fenton reaction, respectively [27-28], which is the most reactive and effective, as it can accept additional electron(e^-) giving rise to water (H_2O) molecule. M/MO NPs can produce different ROS that can participate in different reactions by undergoing oxidation or reduction reactions. The ROS causes DNA damage by the oxidation of amino acids and polyunsaturated fatty acids. Alteration of the balance in the mechanisms of ROS production and elimination, in favour of production, induces the state of cellular oxidative stress in the bacterial cell. O_2 and H_2O_2 originate less acute stress reactions and can be neutralized by endogenous antioxidants, such as superoxide and catalyse enzymes, while OH^- and O_2^- lead to acute pathogens death [29, 30].

The key finding of Haber-Weiss reaction was that H_2O_2 is decomposed by a chain reaction [31, 32]. The reaction chain proceeds by three successive steps, as followed by (i) initiation, (ii) propagation and (iii) termination (Fig. 2).

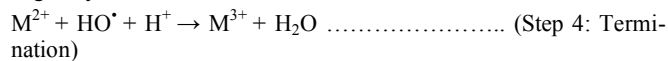
The chain is initiated by Fenton reaction:



Then, the reaction chain propagates by means of two successive steps:



Finally, the chain is terminated when hydroxyl radical is scavenged by a metal ion:



3. ANTIMICROBIAL ASSESSMENT OF M/MO NPs

MO NPs materialize as novel antimicrobial agents and thus, it is essential to examine the effectiveness compared to typical bacteria. Current testing systems are limited by the *in vitro* formulation testing with one microbial species at the time, and rarely against multi-species biofilms. In this section, we review the different types of antimicrobial testing methods that can be used for measuring the antimicrobial activities of NPs. The type of test to be used depends on the purposes and type of info needed to be acquired.

3.1. Disk-diffusion Method

Owing to more convenient, efficient, straightforward and low cost, Disc-diffusion or Kirby-Bauer test is probably the most widely used technique to determine antimicrobial resistance around the microbiological society. A suspension of the isolate (Approx. $1-2 \times 10^8$ CFU/mL) is made according to the McFarland standard; afterward this suspension spreads evenly onto an appropriate agar (Müller-Hinton agar) in a Petri dish with pH 7.2-7.4 [33]. Discs are then saturated with different well-defined concentrations of different Nano-antimicrobial positioned on the surface of agar. A multichannel disc dispenser can speed up placement of the discs. After incubation at 35 °C for 16-24 h, zones of growth inhibition about each of the discs are measured. A clear circular zone of no progress in the immediate vicinity of a disc specifies vulnerability to that antimicrobial [34]. The NPs size, diffusion rate, agar's porosity, and possible charge interactions between the antimicrobial and the agar may affect the diffusion and the final size of the inhibition zone. In theory, the highest concentrations will be nearby the antimicrobial-containing disc and will be diluted away from the centre (Fig. 3) [34, 35].

3.2. Agar Dilution Method

The above-mentioned method is used as a standard for evaluating the minimal inhibitory concentration (MIC). The MIC is noted as less than or equal to the lowest concentration when no growth takes place on any of the agar plates but the growth control. The method includes, the melted agar is mixed to encompass sequential dilutions of the nano-antimicrobial. The subsequent antimicrobial having medium is positioned into Petri-dishes. An aliquot enclosing 104 CFU/mL of test microorganism is located onto the agar's surface and nurtured overnight at 37°C. Then, the plates will be studied for growth to define the last actual concentration to constrain growth (Fig. 4) [36, 37].

3.3. Broth Dilution Method

The broth dilution method-more versatile, generally depends upon microbial inoculation at a specific inoculum density of broth media (in tubes or microliter plates) containing antibiotics at a varying level, usually doubling dilutions are used (*e.g.*, 1, 2, 4, 8, and 16 µg/mL). The standardized bacterial suspension is typically $1-5 \times 10^5$ CFU/mL. Incubation at 35°C overnight, turbidity is recorded either visually or with an automated reader, and the breakpoint concentration is established. The lowest concentration of nanoparticles that prevented growth represents the MIC. The precision of this method is to be ± 1 twofold concentration [38]. Microliter plates or

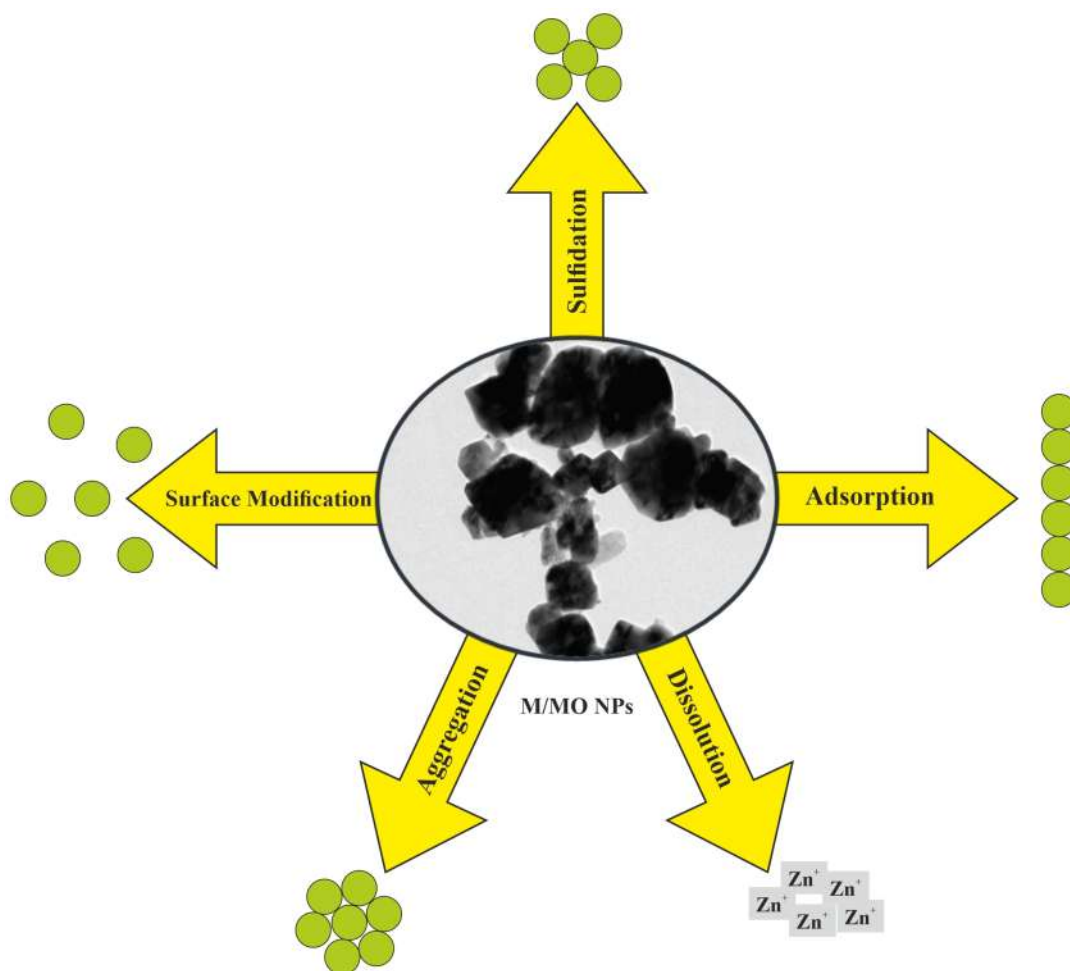


Fig. (1). Fate and interaction of nanoparticles in the environment. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

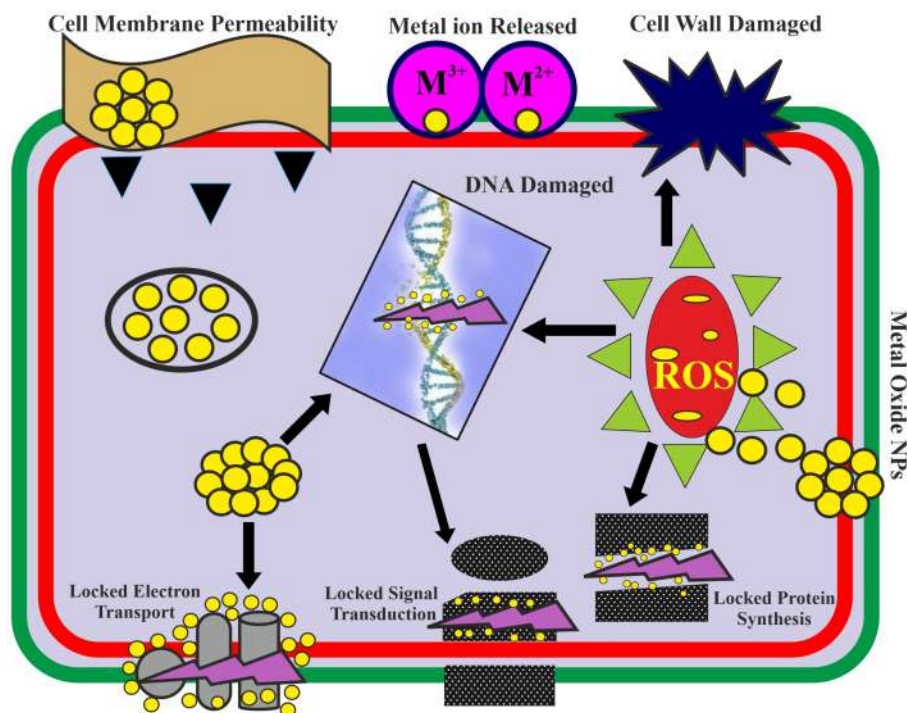


Fig. (2). Mechanisms of interactions between M/MO NPs and bactericidal. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

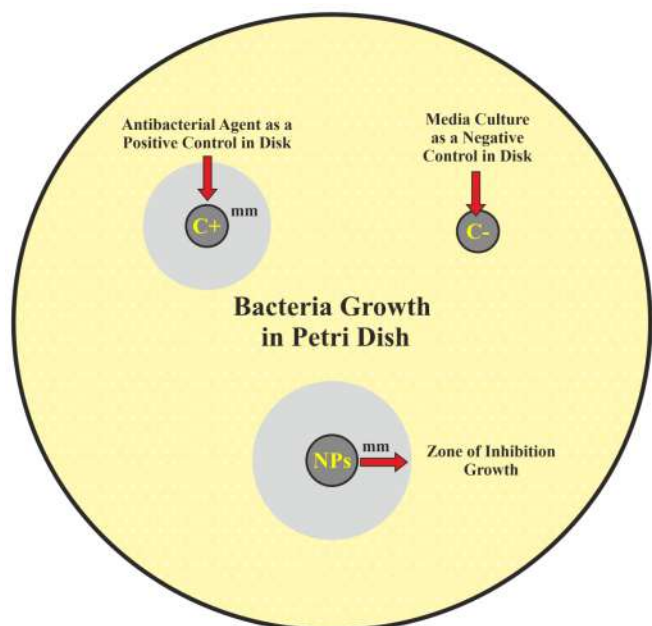


Fig. (3). Disk-diffusion method. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

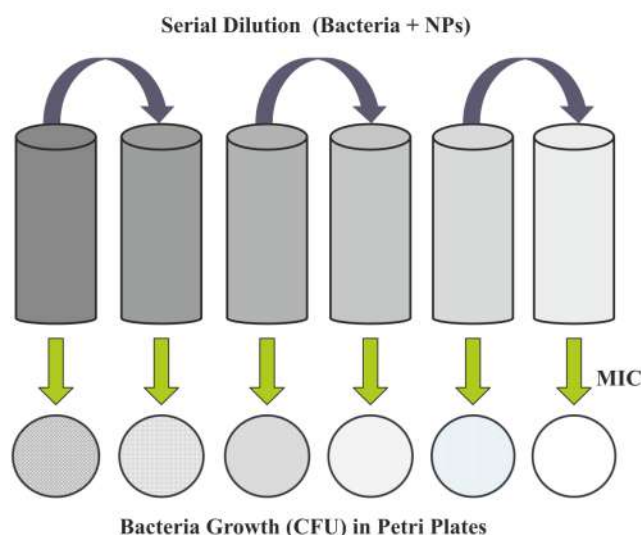


Fig. (4). Agar dilution method. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

ready-to-use strips are commercially available with NPs prepared in the wells. Standard trays contain 96 wells, each containing a volume of 0.1 mL that allows approximately 12 NPs to be tested in a range of eight \times twofold dilutions in a single tray [39]. A variation on this approach is the agar dilution method, where a small volume of suspension is inoculated onto agar containing a particular concentration of NPs. When the inoculum has dried, the plate is incubated and again examined for zones of growth. With this microdilution testing, the method uses about 0.05–0.1 mL total broth volume and can be conveniently performed in a microliter format (Fig. 5).

3.4. Time-kill Method

Bacterial time-kill assay with different concentrations of NPs was determined. Essentially, bacterial growth after treatment at a different time was measured by turbidometry analysis at 600 nm. The optical density difference between control and test (different

concentrations of NPs) was measured after incubation. The reduction in OD values indicates the inhibition activity of NPs and growth inhibition percentage was obtained with respect to the antibiotic positive control [ampicillin (30 μ g)] [40]. To confirm the results, Typically, *Mueller-Hinton* broth is made through serialized dilutions of the test antimicrobial. The nano-antimicrobial concentrations spanning around its MIC are measured by the agar dilution tests. Samples are acquired at 30 min intermissions for up to 2 h. The samples are placed on nutrient agar and survivor counts are plotted to find a ‘time-kill curve’. A loopful of culture was streaked on a nutrient agar plate and nurtured at 37 °C for 24 hrs [41, 42].

3.5. Antimicrobial Activities of MNPs

3.5.1. Gold (Au) NPs

Au NPs are the most studied biogenic metal due to its medical applications and diverse morphologies [43–45]. Au NPs efficiently protect against bacterial cultures because their size is slighlyer than the wideness of bacterial cell wall, allowing them to easily penetrate and inhibit its growth. Au NPs have no bacteriostatic or bactericidal activities and, therefore, are bio-compatible with microbial. However, Au NPs combined with antibiotics have robust bactericidal consequences against drug resilient bacteria. For example, ampicillin bound Au NPs damage ampicillin-resistant bacteria by multiple mechanisms [46].

3.5.2. Silver (Ag) NPs

Ag NPs have been used widely in numerous bactericidal applications as antimicrobial agents as well as treat burns and diversity of infections and have been exploited in personal care products; polymer coatings, pharmaceutical, food, fabrics, and packaging sectors [47]. A large number of literatures has discussed the large-scale green synthesis of Ag NPs with different shapes and sizes using plants, bacteria, fungi, and yeast. The basic antimicrobial mechanism of Ag NPs is based on either release of Ag ions or intracellular deposition of NPs [48]. The comprehensive mechanism chiefly includes damage of cell membrane, disturbance of the energy metabolism system, and generation of oxidative stress by ROS formation, and transcription inhibition. Ag NPs release Ag ions that interact with the cell wall proteins’ sulphur and phosphorus-containing groups and plasma membrane of bacteria [49]. The communication of Ag ions with microbial cells begins with cationic Ag binding with negative charged microbial cell leading to development of multiple pores in the cell membrane and outflow of the intracellular contents, which result in electrochemical imbalance allowing the passage of Ag ions across the plasma membrane into the bacterial cell cytoplasm followed by interaction with the intracellular components leading to permanent damage of the cell [50–52].

Owing to their small size, Ag NPs can cross the peptidoglycan and cell membranes [53], which explain the higher sensitivity of *gram-negative* bacteria near NPs associated to *gram-positive* bacteria that have a thicker peptidoglycan layer. The origins of bactericidal effect are cell wall synthesis inhibition, mediation of protein synthesis by 30S ribosomal sub-unit, and nucleic acid synthesis. Also, Ag NPs enhances the antimicrobial activity of antibiotics such as penicillin G, amoxicillin, vancomycin, clindamycin, and especially erythromycin, against *S. aureus* and *E. coli* [54] In addition, Ag-carbene complexes encapsulated in NPs are effective against multidrug-resistant bacteria [55].

3.6. Antimicrobial Activities of MO NPs

3.6.1. Zinc Oxide (ZnO) NPs

ZnO NPs are very efficient antibacterial agents against both *gram-positive* and *gram-negative* bacteria, two possible mechanisms could be involved in the interaction between ZnO NPs and bacteria:(i) the production of increased levels of ROS, mostly hydroxyl radicals and superoxide ion [56–59] and (ii) NPs deposition

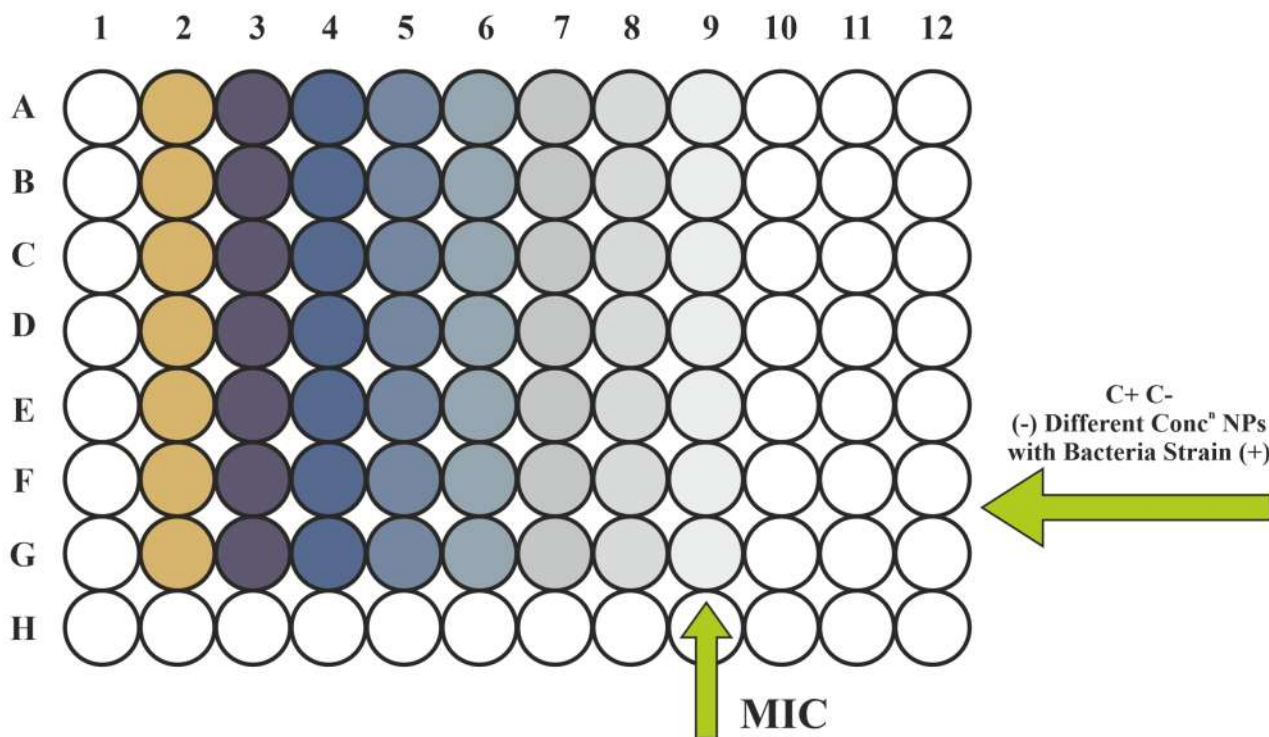


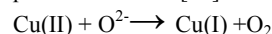
Fig. (5). Broth dilution method. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

on the surface of bacteria or accumulation of NPs either in the periplasmic region of cytoplasm, causing disruption of membranes and disorganisation of cellular function [60, 61]. It has been proposed that ZnO NPs are able to slow down the development of *E. coli* owing to disturbance of cell membranes, which enhances its membrane permeability, helps NPs accumulate directly in the bacterial cell membrane and cytoplasmic regions of the cells. Together, production of the ROS and deposition of ZnO NPs within the cytoplasm or on the surface of *S. aureus* lead to either inhibition of bacterial growth or the killing of *S. aureus* cells. ZnO NPs are very likely through increased levels of oxidative stress in bacterial cells. Therefore, ZnO NPs improved antibacterial action is due to the better creation of the ROS in the existence of ZnO and UV light. ROS such as hydrogen peroxide (H_2O_2), superoxide anion (O_2^-), hydroxyl radicals (OH^\bullet), and organic hydroperoxides (OHPs) are poisonous to the cells as they damage cellular constituents such as DNA, lipids, and proteins [62]. The function of ROS in antibacterial studies has been the subject of passionate discussion, and an overall agreement appears to be elusive [63-64] that assists its antimicrobial activity via the release of Zn^{2+} ion in the cell membrane [65].

3.6.2. Copper Oxide (CuO) NPs

CuO NPs are popular among the scientific community due to their characteristic physico-chemical, biological, and antibacterial properties [66, 67]. The antibacterial property CuO NPs generally depends on the ROS. The characteristics of ROS are due to the existence of huge surface area of CuO NPs with its smaller particle size that increases oxygen vacancies. With increased oxygen vacancies, more more will be reactive oxygen species that will be preferred caused causing cell death due to the damage of Golgi complex, endoplasmic reticulum, mitochondria, DNA, and finally, leakage of minerals in bacterial cells and toxic metal ion are released making them very effective antimicrobial agents. This was absolutely due to superoxide (O_2^-) and hydroxyl (OH^\bullet). Further, superoxide (O_2^-) with hydrogen ion from CuO NPs that generated to HO_2^- radical, and finally, these radicals collided with electrons to generate $H_2O_2^-$ [68, 69]. The CuO NPs produced superoxide ion in

excess related with to standard antibiotics. In the case of CuO, the O_2^- level decreased suddenly that indicate direct adsorption of O_2^- for the reaction with CuO NPs to form Cu(I). The diffusion-controlled reactions are further possible outside the cells in the presence of CuO [70].



At the identical time, Cu_2O did not produce any superoxide radicals. It can be described that Cu^{2+} ion fast reacts with superoxide production, to participate in redox cycling; thus leading to continued oxidative stress.

3.6.3. Nickel Oxide (NiO) NPs

NiO NPs have significantly better and more effective antibacterial activities against all pathogenic bacteria. The activity of NiO NPs annealed at moderate or low temperatures proved that NiO NPs penetrate the cell wall of the strains and alter the cellular membrane and intercellular components leading to cell death. Few reports have also concluded that NiO completely inhibits microbial pathogen growth [71]. The small particle size of NiO could enhance its solubility and the presence of extracellular nickel ions cannot easily pass through the cell membrane via ion channels, but small NiO NPs can be uptaken by cells and then release Ni^{2+} intracellularly [72, 73].

3.6.4. Titanium Oxide (TiO₂) NPs

The antibacterial efficiency of TiO_2 NPs is accredited to the oxidative destruction mostly passable by the ROS, such as O_2^- , H_2O_2 and HO^\bullet . The adsorbed species (such as water and oxygen) produced ROS due to the redox reaction between them and electrons and holes generated by the photo illumination of TiO_2 with UV or sunlight. Studies on gram-negative bacteria reveal OH^\bullet radicals and superoxide ion are expected to be the main reason for the bactericidal effect [74, 75]. Direct oxidation by holes (h^+) from the valence band on the TiO_2 surface has to be emphasized in several studies [76, 77]. Concerning the degradation process, the authors agree that the outer membrane, if present, is the first barrier and, once it is broken, the cytoplasmic membrane is attacked. The loss

of cytoplasmic membrane reliability, which is involved in the process of cellular respiration, leads to the death of the cell [78].

3.6.5. Magnesium Oxide (MgO) NPs

MgO NPs are very efficient and stable as an antibacterial agent; its mechanism is still unknown, but it produced ROS, such as superoxide anion (O_2^-), which is produced in the excess amount due to huge surface area of MgO NPs. ROS mechanism of the antibacterial activity of MgO NPs may be lipid peroxidation and the occurrence of holes in oxygen on the surface of MgO NPs. However, the high alkalinity and presence of oxygen gaps, MgO NPs show an exclusive antibacterial property. When the interaction of MgO NPs with bacteria, subsequently disrupts the bacterial surface, damages the cell membrane and causes lipid peroxidation have been planned to describe the antibacterial properties of MgO NPs [79, 80]. Electrostatic interaction between the bacteria and MgO NPs surface was responsible for cell death [81, 82]. It has been observed that MgO NPs displayed great activity against bacteria owing to the interaction of NPs and bacteria. It was observed that MgO NPs taking up halogen gases owed to the defect nature on their surface having a positive charge, which gives rise to strong interaction with negatively charge bacteria [79, 83].

3.3.6. Calcium Oxide (CaO) NPs

The CaO NPs show excellent antibacterial properties against *E. coli* and *S. aureus*, which is in accordance with the documented literature [84, 85]. The antibacterial reaction is due to strong connections between bacterial cells and CaO NPs. The CaO NPs show adequate antibacterial property due to their large surface area, which offers improved interaction with bacteria and ROS release on their surface [86, 87]. CaO NPs have hydration energy in water because of high alkaline pH and ROS generation [85-88]. The ROS intermingle with the carbonyl linkage that is existing in the bacterial cell membrane, peptide linkages/polyunsaturated phospholipids and influence protein degradation, which consequently indicates the disturbance of bacterial cell wall and discharge of toxic Ca^{2+} ion. Therefore, CaO NPs demonstrated outstanding antimicrobial property but displayed noxiousness due to the generation of ROS free radicals [89].

3.6.7. Cerium Oxide (CeO₂) NPs

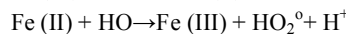
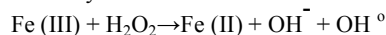
In CeO₂, an atom has two oxidation states (Ce^{4+} , Ce^{3+}). The current literature suggests that Ce^{3+} increases as particle size increases with (Ce^{3+}) are less than 1% in 10 nm particles, whereas it rises to 6% when the size reductions to 6 nm. In addition, the oxygen gap exists in the oxidation states of two CeO₂ NPs [90]. The formations of oxygen hole are complemented by the reduction of Ce^{4+} to Ce^{3+} subsequent in loss of an oxygen molecule. Such distinctive radical scavenging ability of cerium makes CeO₂ NPs find applications in wound healing as they can act as radical scavengers and block the ROS making towards eradicating bacteria [91].

3.6.8. Iron Oxide (Fe₃O₄) NPs

Fe₃O₄ NPs are active antibacterial agents against *gram-positive* and *gram-negative* bacteria. However, they show different effects on growth and membrane activity in *gram-positive* and *gram-negative* bacteria. Importantly, Fe₃O₄ NPs have shown a better bactericidal effect on *gram-negative* than on *gram-positive* due to the presence of ROS, which can lead to oxidative stress, damage of proteins, cell membranes, and DNA, being one of the key mechanisms of nano-toxicity [92, 93]. The ROS production follows the Fenton reaction from the metabolic activity, H₂O₂ which is a toxic oxidant causing DNA and protein damage, created in cultures of all aerobic organisms [94, 95]. Electrostatic interactions between the bacterial cell and NPs result in damaging of cells, which leads to the death of bacteria [96-98]. The small sizes and large surface area of NPs endorse their interaction with bacterial cell membranes, and the inactivation of bacteria could be coupled with a diffusion of

NPs into the bacterial cell [99-101]. Fe₃O₄ NPs dispersal inside the culture media, diverse oxidation-reduction reactions are monitored, including both the species existing in magnetite, Fe^{3+} and Fe^{2+} , subsequent into a generation of different and further strong reactive oxygen species [102-104].

The reactions are known as the Fenton reaction or the Haber-Weiss cycle.



4. AGRICULTURAL APPLICATIONS OF M/MO NPs

Application of NPs in agricultural applications, including nano-fertilizers, nanoparticles, or nanopesticides for nutrient management, genetic improvement, plant disease treatment, and plant growth promotion has been a rapidly growing research area [105, 106]. The cellular responses of bulk and nano-sized metals such as Cu, Fe, Ce, Ti, and Ag or their ions are very different [107]. The use of NPs affords several approaches to increase crop production and crop nutraceutical quality [108, 109]. Recently, the use of NPs, such as insecticides, fungicides, and nano-fertilizers has been investigated, was reported to induce faster germination, increasing the plant tolerance towards biotic and abiotic stresses, favouring efficient nutrients management and increasing plant growth while reducing environmental influence compared to conventional methods [110, 111].

In general, NPs impact on plants depends on several factors including composition, concentration, size, physico-chemical properties, and plant type [112, 113]. Metal NPs concentration exceeding optimal range induces stress and/or toxicity, generates ROS and disrupts cellular metabolism. The plant reacts to these changes by producing antioxidant enzymes and non-enzymatic components to diffuse the effect of ROS cytotoxicity on the cellular and sub-cellular systems [114]. Low doses of Cu NPs (5-20 mg Cu per plant) induce metabolic changes due to Cu accumulation and ROS generation [115]. In addition, when 5 mg L⁻¹ CuO NPs were applied in *Arabidopsis thaliana* (L.) Heynh, the flavonoid content was increased.

A significant gene induction due to oxidative stress, sulfur assimilation, glutathione, and proline biosynthesis was also reported as a result of CuO NPs induced stress [116]. While CuO NPs (0-200 mg L⁻¹) were applied to leaves of cucumber plants, it significantly reduced the fruit firmness [117]. When 0.006 mg L⁻¹ Cu NPs were applied on plants, the total phenols increased the concentration of the enzymatic and non-enzymatic compounds in tomato fruits when altered [118] and similar results were reported in jalapeno peppers with combined treatment with Cu NPs with Chitosan-polyvinyl alcohol (Cs-PVA) at concentration up to 10 mg L⁻¹ [119]. In an attempt to reduce oxidative stress caused by ROS upon application of Cu NPs, the plant activates antioxidant compounds such as glutathione (GSH), vitamin C, and carotenoids and antioxidant enzymes [ascorbate peroxidase (APX), superoxide dismutase (SOD), and catalase (CAT)] [120, 121].

4.1. M/MO NPs in the Food Sector

Potential applications of M/MO NPs in the food industry grows and, consequently, do intended or unintended human exposure to NMs.¹²² However, few studies focused on toxicity associated with the presence of M/MO NPs in food and slight is discovered about bioavailability, biodistribution ways of M/MO NPs, and their ultimate toxicity. Most noticeably, M/MO NPs used as food additives will come in straight interaction with a humanoid body part, subsequent in higher levels of exposure depending on their concentration in food. Therefore, the impact of M/MO NPs increased use in foods as flavours or colour additives has attracted the interest of public and government sectors [123].

A study on TiO_2 in sugar-coated chewing gum revealed that >90% of TiO_2 in chewing gum is nano-sized and can be easily released, swallowed by person chewing the gum, and gradually accumulate in the body [124]. Similarly, upon consumption of foods containing E551, gut epithelium is also exposed to SiO_2 NPs [125, 126]. Nanoencapsulation also leads to direct contact of M/MO NPs with humans through oral intake. For example, SiO_2 NPs used as fragrance carriers or flavours are frequently used M/MO NPs in food [88]. Moreover, lipid-based nanoencapsulation has been developed to improve the performance of antioxidants by enhancing their solubility and bioavailability [127] and entrapping bioactive for effective absorption and targeted delivery [128]. However, the safety of nanoencapsulation remains unidentified and risk assessment and long-term toxicity investigations are necessary [129-131].

Nanoscale edible coatings have emerged as an attractive alternative to preserve food quality, extend storage life, and prevent microbial spoilage [132-134], but also increase direct exposure to M/MO NPs. For example, edible coatings based on gelatine that contain cellulose nanocrystals [135], chitosan/ nanosilica [136],

chitosan film with nano- SiO_2 [137], and alginate/lysozyme nanolaminate coatings preserve fresh foods and extend their shelf-life [138]. Moreover, another new polyethylene nano-packing containing nano-Ag, kaolin, anatase or rutile- TiO_2 preserves the quality of strawberry fruits [139].

5. IMPACT OF M/MO NPS ON PLANTS

M/MO NPs toxic impact on plants is related to their chemical toxicity such as discharge of lethal metal ions and the stress or stimuli produced by NPs surface, size and/or shape leading to higher bioavailability and toxicity of M/MO NPs [140, 141]. Moreover, the toxicity of M/MO NPs involves the production of hydroxyl radicals upon exposure to visible light producing extracellular ROS that can damage the cell membranes and change the membrane permeability-increasing NPs diffusion into the cell [142]. On the contrary, several studies revealed the positive effects of M/MO NPs on plant growth. The impact of M/MO NPs on plants is shown in Fig. (6).

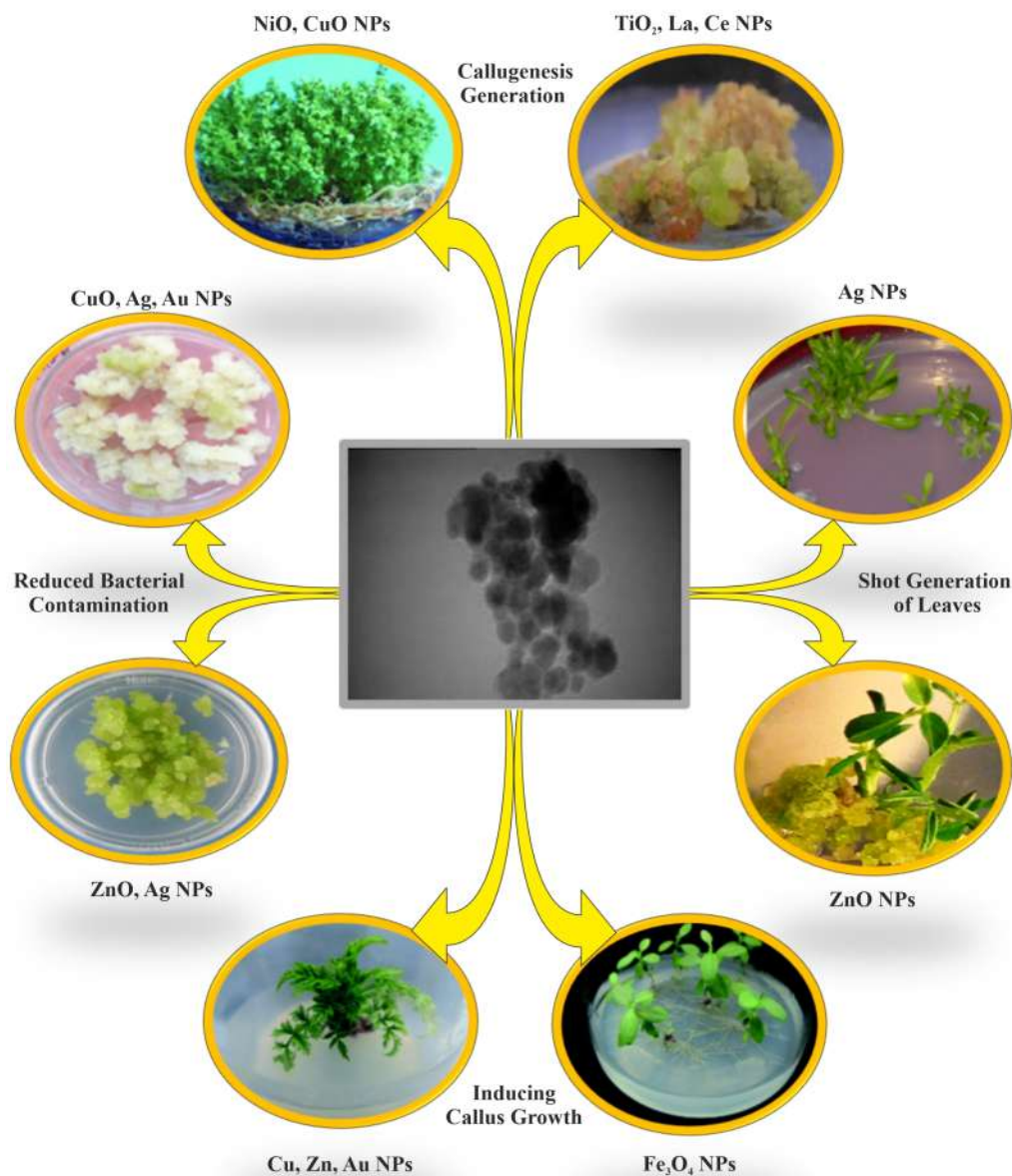


Fig. (6). The impacts of M/MO NPs on plants. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

5.1. Ag NPs

Exposure of snails and soil matrix to Ag NPs decreases the activity and viability of land snail and fungal population frequency in soil [143]. Spherical shaped Ag NPs (10 to 20 nm) showed strong antifungal activity against *Bipolaris sorokiniana*, the spot blotch pathogen of wheat [144]. Ag NPs (200–800 nm) enhance plant growth [145], whereas 35–40 nm appositively influenced the root and shoot growth of different plants [146] due to the inability of large NPs to penetrate in the studied low concentration [147]. An enhancement of lipid peroxidation was also observed in the wheat-pathogen phyto-system compared to NPs or pathogen alone [148]. Due to its fungicidal activity, Ag NPs have a significant impact on eliminating fungi [149]. Nonetheless, regardless of their proven antibacterial activities on a laboratory level, applications of Ag NPs in agriculture are still not very recommended because of the release of silver ions and they induce biomass accumulation in soil [150, 151].

There is a strong correlation between the size of Ag NPs and their toxic impact on the plant as smaller sizes have higher toxicity [152, 153]. For example, higher concentrations of Ag NPs (<30 nm) inhibit the root and shoot growth of different plants as the response to Ag NPs stress leads to enhancement in ROS and making of antioxidant enzymes and molecules as an adaptive mechanism [154–157]. Moreover, Ag NPs impact DNA and influence gene expression in several plants [158–161] and the physiological impacts of Ag NPs expressed as a decrease in transpiration [162], chlorophyll concentration [163–166] and chlorophyll fluorescence [167] are observed. Substantial alteration in various macromolecules, lipids, proteins, lignin, pectin and cellulose was observed in *Raphanussativus* after treatment with 500 mg/L of 2 nm Ag NPs [168] and plant hormones such as cytokinin and auxin are moreover affected by Ag NPs [169, 170].

Recent studies revealed that a combination of Ag NPs with different treatment/compounds impacts plants differently [171, 172]. For example, Ag NPs treatment combined with the magnetic field improves yield in *Zeal mays*, whereas nitric oxide controls Ag uptake, antioxidant system, oxidative stress, and anatomical structure as well as alleviates the impact of Ag NPs [173].

5.2. Cu/CuO NPs

Cu is a vital micronutrient combined in numerous proteins and enzymes and plays a significant function in plant nourishment. Cu NPs have various applications such as gas sensors, catalysts, electronics, batteries, heat transfer nanofluids, and antimicrobial agents.¹⁷⁴ Due to its oxidation state, CuO NPs have higher toxicity than Cu NP. Low concentrations (<0.25 ppm) of CuO NPs positively impact on *Elodea densa* (waterweed) and stimulate photosynthesis, but higher doses (>1 ppm) suppresses photosynthesis. The morphology of the roots is badly affected with Cu and CuO NPs and complete inhibition is reached at a high dose of NPs [175–180]. Different antioxidant compounds were observed to be significantly increased in Plants treated with CuO NPs, found to have increased levels of antioxidants possibly due to activation of the plant protective mechanism. Several researchers reported large accumulation of oxidatively altered, mutagenic DNA lesions in different plants upon treatment with CuO NP; which also affect the photosynthetic activity negatively by inactivating PS II reaction centers reducing electron transport, photosynthetic pigments, thylakoid number per grana, transpiration rate, photosynthetic rate, and stomatal conductance.

5.3. ZnO NPs

Zinc insufficiency is a general micronutrient issue that undesirably affects agricultural production in alkaline carbonate soils, characteristics of arid and Mediterranean. Zinc availability in calcium carbonate soils is limited by the alkaline pH that reduces zinc solubility and the high calcium carbonate (CaCO₃) content that

absorbs and precipitates zinc. Diffusion of dissolved zinc movement from fertilizer to the plant roots follows the dissolution process. ZnO NPs have stronger antimicrobial activity than large zinc particles [181] and can induce ROS generation that causes cell death as the anti-oxidative capacity of the cell exceeds. Generation of reactive nitrogen species (RNS) and hydrogen peroxide (H₂O₂) upon exposure to Ag and ZnO NPs on the duckweed (*Spirodela punctata*) reveals the toxicity of Ag and ZnO NPs which is mainly caused by the particulates and ionic forms. Zn NPs encourage free radical development in wheat, high levels of antibacterial activity against *B. subtilis* and *S. paratyphi*. Biosynthesized ZnO NPs protect against bacterial and fungal phytopathogens indicating as effective antimicrobial and anticancer mediators for biomedical uses [182].

5.4. TiO₂ NPs

TiO₂ NPs are widely used in wastewater treatment as a photocatalyst, anti-corrosion coatings, personal-care products, antiseptic and wastewater. TiO₂ does not form toxic and dangerous compounds and, therefore, can have applications in plant protection as it possesses excellent pathogen disinfection efficiency that can be further enhanced by dye doping and other methods. Few studies indicate that TiO₂ NPs might have a constructive and destructive influence on plants with studies where TiO₂ NPs were used at foliar level discloses encouraging impact on plants. Ti encourages the manufacturing of more carbohydrates growth and photosynthesis rate in plants. TiO₂ can photo-catalytically degrade pesticides. Moreover, foliar treatment of TiO₂ NPs resulted in improved plant growth, rises fruit yield, and chlorophyll concentration in *Solanum lycopersicum*. However, high concentrations of TiO₂ NPs are poisonous to plants, even in soil systems with a phytotoxic response similar to Ag NPs or CuO NPs leading to a reduction in plant growth and mitotic index and rises in ROS, antioxidant activity, and genotoxicity [183].

6. M/MO NPs IN PESTICIDES

Insects make up more than half of Earth's diversity of species with a very successful evaluative history. The insects are the important organism on our planet because of significant evolutionary features like wings, malleable exoskeleton, high reproductive potential, habits diversification, desiccation-resistant eggs and metamorphosis. While insects act as a vector for many vector-borne diseases and damage various agriculture land by infecting various crops, it influences health and economy as well. To suppress agriculture loss, several chemicals have been utilized to defeat their reproduction and feeding habits [184]. Metal oxide could be used as pesticides as shown in Fig. (7).

Nanotechnology is an encouraging arena of the interdisciplinary research study; it would be boon for agriculture crop management. While the utilization of NPs for crop protection in agriculture, it is an under-explored research area [185]. To overcome the pest population in agriculture land, pesticides are used and important for national food security. Nanomaterials can offer targeted tools in the form of pesticides with environmentally responsive controlled releases *via* compound and chemical changes. Many countries are now being shifted from the use of chemical pesticides to biological control, wherever the usage of pesticides and biological nanomaterials have a vital function to play in pest control [186, 187]. Since the preparation of nanomaterials is simple and reliable, it was prepared from *Pongamiapinnata*, *Azadirachta indica*, *Annona squamosa*, *Chrysanthemum sp.* and utilized for various biological purposes [188–191].

6.1. Occurrence of NPs in Several Insects

NPs are naturally occurring nano-structures but are being overlooked [192]. Nanotechnology-based industries have made little use of 'free' technology accessible in nature [193]. A serious instance is

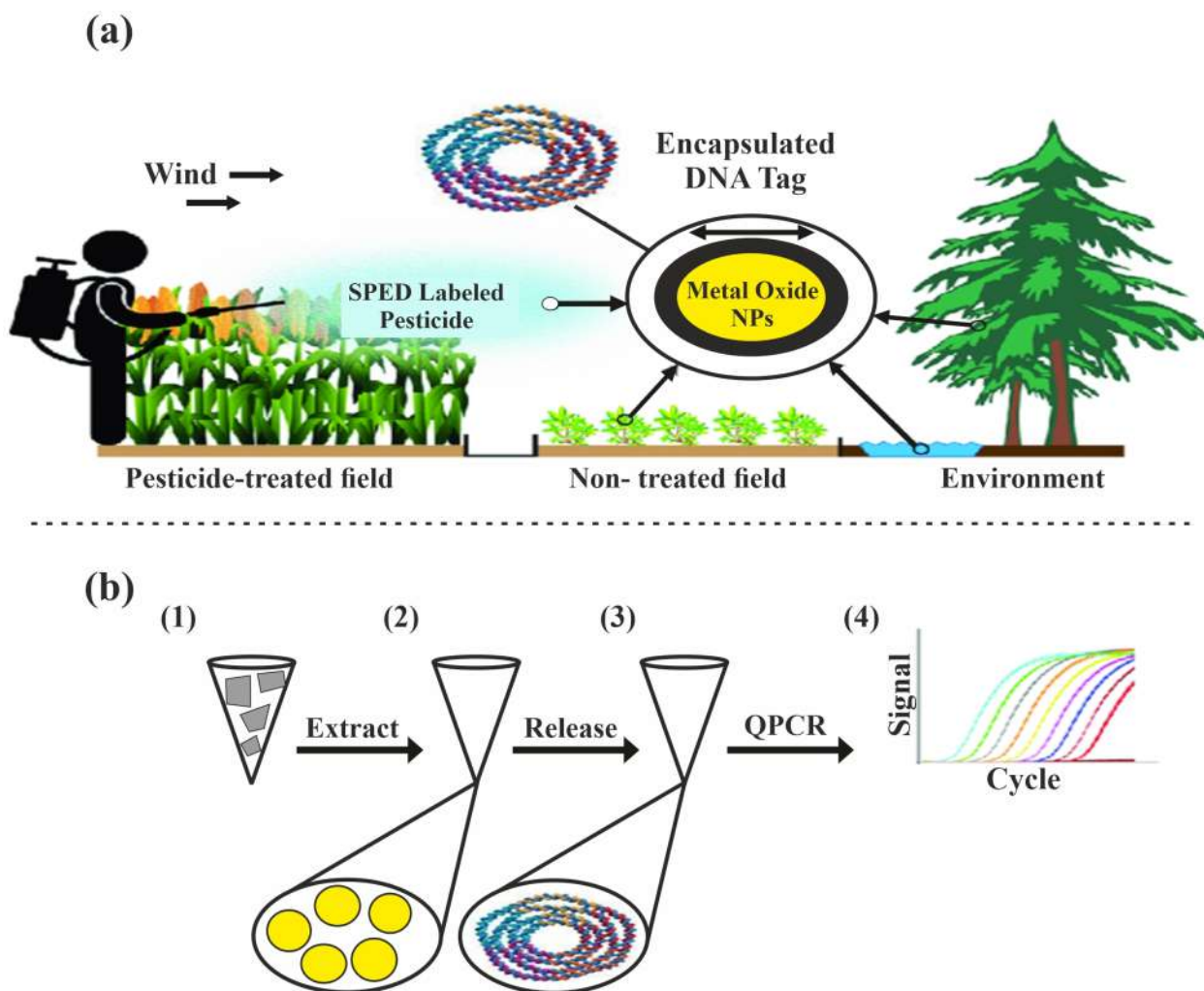


Fig. (7). MO NPs in agriculture as pesticides. (A higher resolution / colour version of this figure is available in the electronic copy of the article).

the ordered hexagonal packed array of constructions in the wings of cicada, for instance, *Psaltodaclaripennis* and termite, for example, *Rhinotermitidae* family [194]. Surveys have indicated that the size of NPs may vary from 200 to 1000 nm [195]. The structures tend to deliver a rounded shape at the apex and protrude some 150-350 nm out from the surface planer. These wing NPs help in the aerodynamic efficiency of the insect. Nanostructure correspondingly exists in the eyes of pests. The colour element of the butterfly's wings is nothing but NPs.

6.2. Nanopesticides

Nanopesticides can be defined as the plant protection products formulated intentionally using NPs, to enhance efficacy and reduce an environmental load of pesticides. Nanopesticides include a large diversity of products and cannot be regarded as a solitary class. Nanopesticides can comprise of carbon-structured parts (e.g. polymers) or inorganic ingredients (e.g., metal oxides) in numerous forms (e.g., particles and micelles). The aims of nano-formulations are mostly similar to other pesticide formulations and consist in growing the apparent solubility of the poorly soluble active ingredient, liberating the active ingredient in a slow and targeted manner and shielding the active ingredient against early degradation.

6.3. Developing New Nanopesticides

Ecologists have long tried to manage outbreaks of insects by biological control, which is a lengthy process. Controlled release formulations (CRFs) subordinate the active compound with inert

materials. Furthest controlled release bio-pesticides applications still are successfully made due to the progresses in the nanotechnology part. Nanocapsules have been widely utilized in the medicinal area as a drug carrier in the handling of various diseases [196-198]. Microencapsulation has been employed as a flexible instrument for hydrophobic pesticides, improving their dispersal in aqueous media and allowing a controlled release of an active compound. As smart delivery systems, they discuss more selectivity, without hindering in the bioactive compounds to the target pathogen [199]. The advantages of the use of NPs insecticides is it decreases the troubles related to drifting and leaching, due to its substantial nature, and pointers toward a further active interaction with the target pest.

6.4. Nanoencapsulation

It is a technique in which a chemical is gradually but well released to the special host for insect pest control. Release mechanisms comprise dissolution, biodegradation, diffusion and osmotic pressure with specific pH [200]. Encapsulated citronella oil, nano-emulsion is made by high-pressure homogenization of surfactant and glycerine. Nanopesticides, nanofungicides and nanoherbicides are being utilized proficiently in agriculture [165]. Bhagat *et al.* [201] stated that eco-friendly controlling of fruit flies including pheromones, is advantageous in cutting down the unwanted pest populations accountable for reducing the yield and crop quality. A nanogel has been made from a pheromone, methyl eugenol (ME) using a low-molecular-mass gelator. The participation of the nano

gelled pheromone brought about active management of oriental fruit fly, *Bactrocera dorsalis*, a predominant injurious pest for a number of fruits with guava [202].

6.5. Pest Management in Agriculture

Nanotechnology has transformed conventional agriculture into a modern counterpart. They have shown countless potential for pest management and control. However, it also produced some new concerns in the form of pest resistance. Polyethylene glycol-coated NPs have showed the enhanced insecticidal activity of garlic essential oil against *Tribolium castaneum*. Estimated control efficiency around 80% against adult *T. castaneum*, attributed the slow and constant liberation of active ingredients from the NPs. Uses of various NPs like Ag, Al₂O₃, ZnO, TiO₂, etc used in management and control of rice weevil, grasserie disease in silkworm, baculovirus caused by *Sitophilus oryzae*, *Bombyx mori* and *B. mori* nuclear polyhedrosis virus, respectively. The transformation of *Bombyx mori* nucleopolyhedrovirus by lipophilically coated SiO₂, Al₂O₃ NPs in the hexagonal close-packed α structure and aspartate capped-Au NPs in *B. mori* cell line using cytopathic effect and plaque reduction assay was studied by Das *et al.* Consequently, commercially accessible insecticides, inorganic Al₂O₃ may offer a low-priced and consistent option for control and management of pests. Debnath *et al.* studied the entomotoxicity of SiO₂ NPs against rice weevil and compared the efficiency with bulk-sized SiO₂. Non-crystalline SiO₂ NPs possess high effectivity more than 90% mortality against the pest, pointing towards the effectiveness of SiO₂ NPs to management and control pests. Nano-encapsulation of pesticide permits appropriate absorption of the chemical into the plants, owing to slow and constant liberation which has a long-lasting and persistent effect, unlike the normal agrochemicals. Man-made pesticides have harmful environmental impacts, but their high specificity to the targeted pests. Thus, there is a necessity to overcome the limitations of botanical insecticides with the use of NPs-based technologies in pest management.

6.5.1. Nanoherbicide

Weeds are the main menace, which reduces crop productivity to a greater extent in the farming sector. Eradicating weeds using traditional techniques is lengthy. There are numerous commercial herbicides available in the market. They exterminate the weeds as well as an impairment to the standing crops. They are accountable too in reducing the soil fertility and consistently, contributing to soil contamination. Nanoherbicides can play a vital role in weeds control from crops *via* an environmental friendly way. Encapsulation of polymeric NPs with Herbicides results into environmental safety. Uneven application of herbicides leaves behind traces in soil, which lays the foundation to damage the standing crops. Incessant employ identical herbicide for the regular time period. Weeds develop the resistance against the same herbicide. Loading of target-specific NPs with the herbicide has been produced for delivery in the roots of weeds. These molecules go into the roots of weeds, translocate into cells and constrain metabolic pathways such as glycolysis. Finally, direct towards the demise of plants.

Noxiousness study of poly(ϵ -caprolactone) nanocapsules comprising ametryn and atrazine against alga *Pseudokirchneriella subcapitata* and the microcrustacean *Daphnia similis*. Ag NPs chitosan encapsulated paraquat nano herbicides used against *Eichhornia crassipes*. Ag, Cu, Fe, Zn, Mn-based nanoherbicides used against *Allium cepa*, Cu nanoherbicides used against *Cucurbitapepo*, CuO nanoherbicides used against *Raphanussativus*, *Lolium perenne* and *Lolium rigidum*, CuO and ZnO nanoherbicides used against *Fagopyrum esculentum*, Cu nanoherbicides used against *Eloдея densa*, CuO and ZnO nanoherbicides used against *Cucumis sativus*.

6.5.2. Nanobarcode

Nanobarcode are prepared through a vastly scalable, semi-automated electroplating process using inert metals such as Au, Ag, etc. into templates defining particle diameter. These nanobarcode are used as recognition tags for multiplexed investigation of gene expression. Nanotechnology supported progression in biotechnology has seen enhancement in the plant resistance in the direction of environmental stresses. While the capability of extracts from different plant species to prepared NPs could be described using the extensive existence of polyphenolic compounds in the kingdom of plant. An accurate knowledge of the green synthesis method is required to understand the potential of process in the medical and industrial sectors. Producing consistently dispersed NPs through green synthesis is a big challenge, as several parameters like temperature, pH, nature of capping agent; concentration of active ingredients may play an important function in defining the size and morphology.

Therefore, dropping the capping, or stabilizing agents contributing to the green synthesis is required to be examined to specify NP structural relationships. NPs prepared by medicinal plant extracts should be examined for a variety of bioactivities compared to Physico-chemical synthesized NPs, to study whether the observed bioactivities could be due to the existence of capping agents in the NPs. Taking into consideration, bioactivities of NPs differ in their size, shape and zeta-potential. In spite of outstanding antibacterial properties reported against antibiotic-resistant strains, it is not clear whether this is due to NPs, the compounds attached to NPs, or both.

CONCLUSION

Currently, NPs are used vastly and have become an essential part of humanoid life. Nevertheless, owing to the existing prerequisite and modern life, environs cannot be ignored. It is noticeable from the assessment that M/MO NPs in superfluous are dangerous to plant life, while, in traces, beneficial for plants. Nanoscience is a fascinating lot of research finance, particular of which needs to be diverted for the alertness of the people about the appropriate discarding of NPs based products. This review article clearly shows the influence of M/MO NPs on plant life; however, there is a necessity of study to understand the molecular mechanism of plant-NPs interaction. There are many research articles that display the favourable part of M/MO NPs in the agriculture sector, on the other hand, the mechanism at large extent yet to be unstated, and the studies are in its preliminary phase. Consequently, numerous study research is essential before bringing the NPs to the field. The maximum study shows morphological variation caused to plants due to the M/MO NPs. Thus, research is desirable in the area to know the influence of M/MO NPs on the plant. Subsequently, applying eco-friendly practices has become more and more indispensable for accomplishment in today's agro-business; bio-inspired attitude is attractive in biological researches and several other appropriate arenas.

AUTHORS' CONTRIBUTION

The authors (whose names are mentioned in the paper) pronounce that this work was collaboratively done by them. Initially, Dr. Ratiram Chaudhary, Dr. Prashant Ingle, Dr. Trimurti Lambat, and Dr. Ashish Tiple) made out-line of review articles. Then, plants taxonomy and callus investigation was done by Dr. Subhash Somkuwar. Further, Mr. Ajay Potbhare, and Dr. Ganesh Bhusari and Dr. Alok Rai contributed their investigation and write up on nanomaterials and its biological aspects. Dr. Ashish Tiple contributed write up on pest control. Later, the manuscript was well written, thoroughly evaluated and compiled by both corresponding authors (Dr. Ratiram Chaudhary and Dr. Ahmed Abdala). All the authors have reviewed and approved the content of the submitted manuscript.

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CONFLICT OF INTEREST

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Defluoridation of Water by Using Modified Material Developed from *Ficus benghalensis* Leaf: Characterization, Kinetic and Thermodynamic Study

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Abstract. In the present study, microwave-assisted and chemically treated carbonized *Ficus benghalensis* leaf (MACFBL) material was used as an adsorbent material for the removal of fluoride from water. The results of the characterization of MAFBL carbon material exhibited ideal adsorbent properties. The fluoride adsorption experiments were performed under the batch mode to improve the different affecting parameters such as contact time (0-300 min) and temperature (303-343K) at predetermined pH (5), agitation speed (120 strokes/min), fluoride concentration (2 mg/L) and adsorbent dose (5 g/L). The maximum fluoride removal efficiency of fluoride on MACFBL material was found 86.5 %. The fluoride adsorption data applied for four well known kinetic models such as pseudo first-order, pseudo second-order, intra-particle diffusion, and Elovich kinetic models. The pseudo second-order kinetic study shows the most favourable mechanism for the removal of fluoride. Thermodynamic investigation proposed that the fluoride adsorption process onto MACFBL was exothermic. The instrumental study of MACFBL adsorbent material before and after adsorption during FTIR, SEM, EDX and XRD techniques established the fluoride adsorption on the carbon surface. The developed adsorbent material (MACFBL) is efficient for the removal of fluoride.

1. Introduction

The rise in high concentrations of fluoride in groundwater is of significant concern worldwide due to natural and anthropogenic actions contributing to health threats for the human population [1,2]. In general, fluoride in ground is derived through the degradation of distinctive natural minerals found in the different soils and rocks with which the water interacts[3]. Fluoride can, other than natural sources, originate in effluents from the semiconductor, metal processing, fertilizer and glass manufacturing industries [4,5]. The maximum allowable limit of fluoride content in drinking water for a human being is 1.5 mg / L, as set by the Bureau of Indian Standards (BIS) and WorldHealth Organization (WHO) [6,7]. Fluoride is an extremely toxic ion at concentrations greater than the allowable level and may contribute to multiple health issues, such as skeletal fluorosis, dental fluorosis, neurological injury, osteoporosis, parathyroid damages, Alzheimer's disease, male infertility, thyroid and kidney problems, liver damage, etc.[8].

In many developed and developing countries, including Asia, the USA, and Africa, higher fluoride concentrations in groundwater have been recorded. It has been found that with excess fluoride concentration, 17 different states of India are strongly affected, particularly Andhrapradesh, Telangana, Rajasthan, Madhya Pradesh, Gujarat, Assam, Uttar Pradesh and Tamilnadu [9, 10]. Owing to their adverse effects on humanwellbeing and the environment, various methods for the expulsion of



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fluoride from water have been developed over a few decades. That includes ultrafiltration, separation of solvents, sedimentation, absorption, coagulation, reverse osmosis, electrodialysis, ion exchange, adsorption, etc. [11, 12, 13]. In view of its low-cost installation, quick and simple maintenance, effective efficiency and fast operating procedure, adsorption is extensively considered and adopted among all these methods [12, 13].

The condition of excess fluoride content in drinking water is increasing gradually, and commonly used adsorption methods have been used to conduct water defluoridation. In recent years, activated carbons and various unconventional biomass materials such as Citrus limonum (lemon) leaf [3], KOH-treated Syzygium cumini Seed [10], Sawdust [11], tree bark [14], leaves [15], fruit shell / peel [16] and fruit seed [17] have been investigated and recorded for fluoride removal due to their low cost, simple availability in large amounts and effective fluoride removal. Industrial activated carbon treated with sugarcane bagasse[18], Hyacinth beads [19], aluminium impregnated coconut fibre [20], Camellia oleifera seed shell,[21], Santalum Album Leaf Powder[22], Al-impregnated Eucalyptus bark[23], Tea waste biomass[12, 24] and various carbon material identified by researchers for defluoridation of water [25]. The purpose of the present study is to set up and investigate the kinetic and thermodynamic efficacy of non-conventional adsorbent material obtained for the removal of fluoride from the aqueous solution using *Ficus benghalensis* leaves.

2. Material and Method

Analytical grades chemicals were used in the present work, such as sodium hydroxide, acetic acid, hydrochloric acid, nitric acid, sulphuric acid, sodium fluoride, sodium bicarbonate, sodium sulphate, sodium chloride, sodium phosphate, potassium hydroxide, sodium nitrate, 1, 2-cyclohexane diaminetetraacetic acid (CDTA) and these chemicals were acquired from S-D Fine Chemicals Ltd or Merck India Limite Ltd.

2.1. Preparation of Adsorbent

The *Ficus benghalensis* leaf collection was taken from the neighbourhood area. To extract dust and additional impurities, it was washed with water. It was ground using a home blender after air drying and then sieved through a mesh size of 300. The leaf sample was rinsed with double distilled water and was dried for 24 hours in an oven at 80 °C. The resulting dried leaf powder of *Ficus benghalensis* was carbonised in the muffle furnace at 500°C for 5 hours. This carbonised leaf powder was again triggered for 30 minutes at one-minute intervals in a domestic microwave (900MW). The microwave-assisted carbonised leaf powder was then individually impregnated for 24 hours with 0.5 N sodium hydroxide and 0.5 N sulfuric acid. With double purified water, the resulting carbon material was washed until a stable pH of the slurry was produced. Finally, the carbon sample was dried in a vacuum oven at 110 °C, mashed well and kept for future use in airtight plastic containers. Microwave-assisted carbonised *Ficus benghalensis* leaf is the activated material developed from the *Ficus benghalensis* leaves and was referred to as MACFBL subsequently (Figure 1).

2.2. Characterization of adsorbent

2.2.1. Proximate analysis

Physico-chemical parameters of MACFBL were studied, like pH, moisture, ash, volatile matter, bulk density, fixed carbon, water, and acid-soluble matter of MACFBL were examined. The results of the ultimate analysis were summarized in Table 1. Using the Elico pH metre, model LI-120, the pH of the

MACFBL bio adsorbent material was determined and other parameters were evaluated by utilizing standard analytical test methods [28, 29, 30].

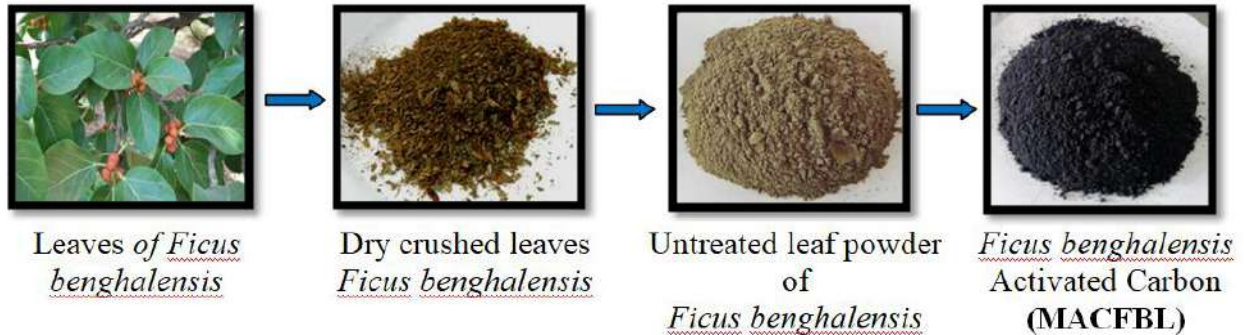


Figure 1: Graphical representation of the development of carbon material (MAFBL)

2.2.2. Ultimate analysis.

The Brunauer-Emmett-Teller (BET) surface area pore characteristics were analyzed by using by a Quanta Chrome Nova-1000 surface analyzer instrument using a computer and software-controlled nitrogen gas adsorption analyzer at -196°C . Using the Elementar Vario EL III model (C-H-N Analyser), the elements like C, H, N, and S were analysed. Scanning Electron Microscopy (SEM) (JEOL Model JSM-6390LV) was used for the study of MACFBL's microstructure morphology. Electron dispersive X-ray (EDX) (JEOL JSM-7600F FEG-SEM model) was used for the element and chemical classification of the developed MACFBL material. The FTIR spectra were obtained by using Fourier-Transform-Infrared-Spectrophotometer (Thermo Nicolet, Avatar 370) with KBr. The FTIR spectra give information about the characteristic functional groups nearby on the MACFBL bio-adsorbent material. The Structural integrity of the bio-adsorbent samples was checked by Powder X-ray diffraction (Model: Bruker AXS D8 Advance diffractometer).

2.3. Batch adsorption experiments

The developed MACFBL carbon material was used for the defluoridation of water by batch adsorption experiments at different initial concentrations of fluoride (2 mg/L to 10 mg/L). The 50 ml of known synthetic fluoride concentration solutions were taken for a batch test in 100 ml of Erlenmeyer flask and were shaken at 120 strokes/min for prearranged contact time, adsorbent dose, temperature and pH. The fluoride concentrations before and after adsorption were estimated by utilizing fluoride ion-selective electrode (HANNA Model No. H I 4110) and ion-selective meter (HANNA Model No. HI 4522). The adsorption capacities of fluoride were determined by the equation(1):

$$q_e = \frac{(C_0 - C_e) V}{m} \quad (1)$$

Where m , V , C_0 , C_e and q_e are the mass of adsorbent (g), the volume of the sample solution (L), initial concentration of fluoride (mg/L), fluoride concentration at equilibrium (mg/L) and amount of fluoride adsorbed at equilibrium (mg/g), respectively. The fluoride removal efficiency from the water was evaluated by equation (2):

$$\% \text{ Removal of fluoride} = \frac{(C_0 - C_e)}{C_0} \times 100 \quad (2)$$

The impacts of agitation speed, adsorbent dose, contact time, pH, temperature and initial fluoride concentration have been considered for fluoride removal from the aqueous solutions by

utilizing MACFBL material. The kinetic of fluoride adsorption was studied by applying four different models, e.g., pseudo first-order, pseudo second-order, Elovich and Intra-particle diffusion models [Table 1]. The thermodynamic analysis for enthalpy change, entropy change and free energy change was carried out the fluoride adsorption onto MACFBL carbon material. Finally, fluoride desorption study and impact of various counter anions has been investigated for the removal of fluoride onto MACFBL material.

Table 1. Empirical kinetic equations and its parameters [31, 32].

Kinetic Models	Kinetic equations	Equation Numbers
Pseudo first-order kinetic model	$\log(q_e - q_t) = \log q_e - \left(\frac{k_1}{2.303}\right) t$	(3)
Pseudo second-order kinetic model	$\left(\frac{t}{q_t}\right) = \left(\frac{1}{k_2 q_e^2}\right) + \left(\frac{1}{q_e}\right) t$	(4)
Intra-particle diffusion model	$q_t = k_d t^{1/2} + C$	(5)
Elovich kinetic model	$q_t = \left(\frac{1}{B}\right) \ln AB + \left(\frac{1}{B}\right) \ln t$	(6)

4. Result and Discussion

4.1. Characterization of adsorbent material

Table 2. provides the physicochemical characterization results of the chemically activated microwave-assisted carbonized *Ficus benghalensis* leaf (MACFBL), i.e. the proximate and ultimate analysis. The Physico-chemical results obtained by characterization of MACFBL shows that the chemical activation and microwave treatment achieves the tremendous adsorbent carbon material required for fluoride adsorption.

4.2. Fourier transforms infrared (FTIR) study

Figure 2(a) displays the FTIR spectrum of the MACFBL carbon material before and after fluoride adsorption. The number of peaks reflects MACFBL's adsorptive existence. The peaks in the region 3700 to 3400 cm^{-1} is because of the existence of -N-H and -O-H stretching vibrations. The peaks in the region 2900 to 2500 cm^{-1} represents the -CH₂ symmetrical and asymmetrical stretching. The peak region from 1700 to 1400 cm^{-1} reveals the appearance of the carbonyl group of ketones, esters and amide. The peaks due to -N-H deformation and bending were observed in the region 1400 to 1500 cm^{-1} . Around 1200 to 500 cm^{-1} position, peaks observed due to the existence of -C=S, -C-N, -C-H -C-O and -C-C- stretching vibrations and deformations. The shift in peak values and intensity band decrease might be because of the appearance of a chemical relationship between the functional groups which is in attendance on the surface of MACFBL. The shifts in the spectra demonstrate that MACFBL will be a helpful adsorbent material in the fluoride adsorption process. The IR band which either disappeared or decreases/increases in intensity after adsorption may engage in fluoride binding. Similar perceptions are accounted for by various scientists for fluoride adsorption [29, 30, 31, 32].

Table 2. Proximate and Ultimate analysis of MACFBL material

Proximate Analysis			Ultimate analysis		
Sr. No.	Parameters	Values	Sr. No.	Parameters	Values
1.	Bulk density (gm.cm ⁻³)	0.39	1.	Carbon %	39.74
2.	Moisture content %	4.28	2.	Hydrogen %	1.09
3.	Ash content %	14.73	3.	Nitrogen %	0.55
4.	Volatile matter content %	32.65	4.	Sulphur %	00
5.	Fixed carbon content %	48.34	5.	Oxygen %	58.62
6.	pH	7.63	6.	Surface Area (m ² .g ⁻¹)	109.41
7.	Water Soluble Matter (%)	1.24	7.	Average Pore Diameter (A ⁰)	90.72
8.	Acid soluble matter (%)	3.73	8.	Total Pore Volume (cc .g ⁻¹)	0.248

4.3. X-ray diffraction (XRD) study

The XRD spectrum of MACFBL adsorbent before and after the removal of fluoride as presented in Figure 2(b). The strong main peak indicates the existence of a very much organized crystalline structure and noises in the XRD patterns show the amorphous nature of carbon material before and after fluoride adsorption. The strength of the well-structured peaks is also diminished to some extent. The XRD spectrum shows the fluoride adsorption was recognized by the physisorption process on the upper part of the MACFBL surface [32, 33].

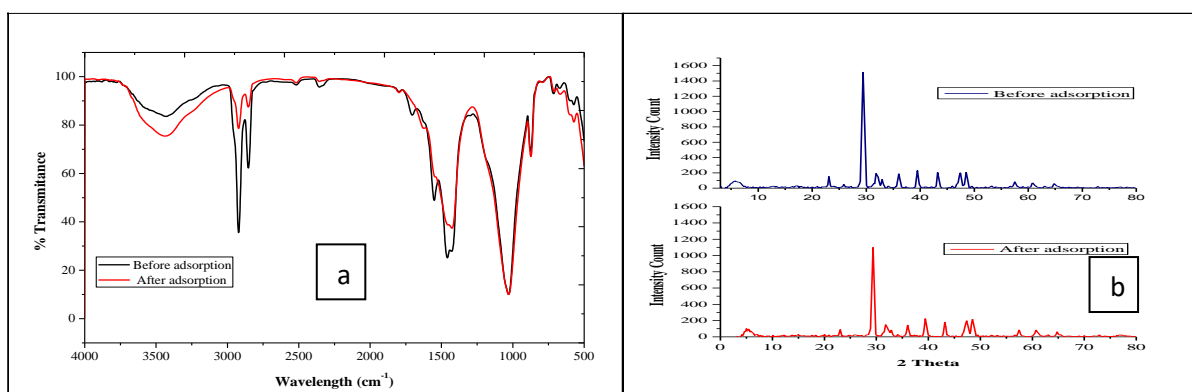


Figure 2. (a) Fourier-Transform-Infra-red (FTIR) spectra, (b) X-ray diffraction spectra of MACFBL before and after removal of the fluoride.

4.4. Scanning electron microscope (SEM) study

SEM micrographs of the MACFBL material before and after the adsorption of fluoride are seen in Figure 3 (a, b). SEM pictures of MACFBL shows that the adsorbent material has a rough surface with nearly non – compact structure. It is apparent that the adsorbent has a significant number of pore spaces, where proper conditions exist for fluoride ions to be caught and adsorbed into these pores. The bright spot demonstrates the existence of tiny holes on the crystalline structure of activated carbon material and after handling with fluoride the bright spots converts the black suggests the adsorption of the fluoride on the carbon surface through the physisorption process [30, 32, 33, 34].

4.5. Energy-Dispersive X-ray (EDX) study

The EDX outcomes of the MACFBL material shown in Figures 3(a) and 3(b) indicate the variations between the number of elements in the adsorbent carbon material before and after adsorption of the fluoride. The fluoride content found in the EDX pattern for adsorbent material after contacting with adsorbate in aqueous solution indicates towards the adsorption of fluoride.

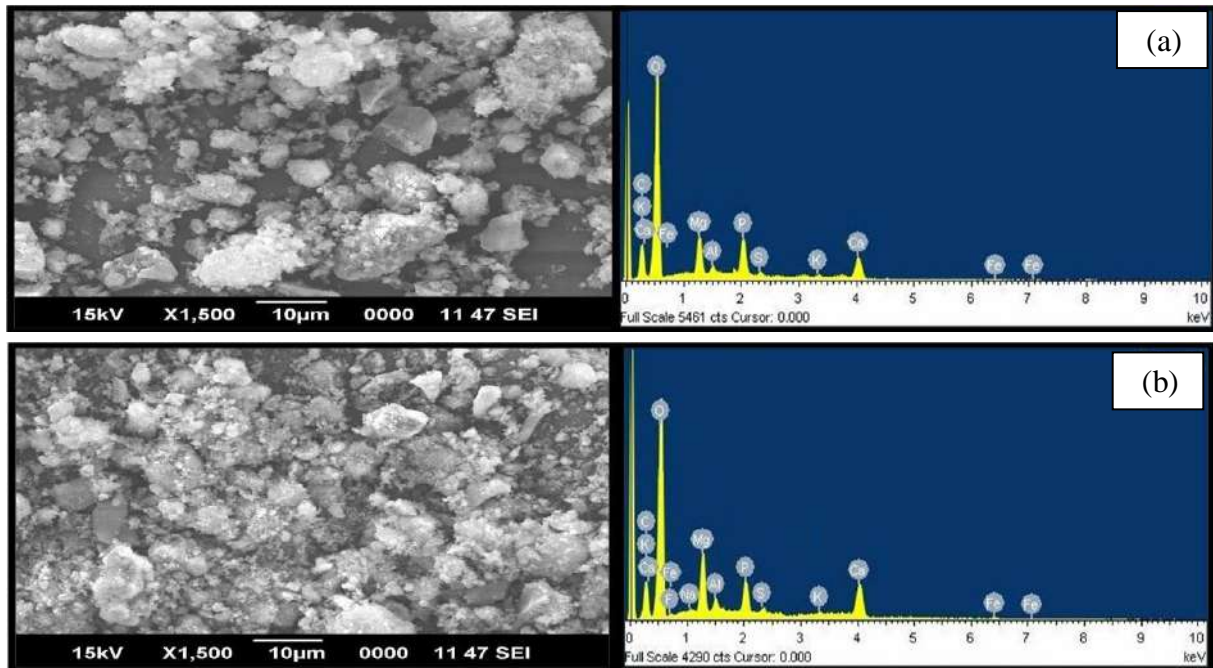


Figure 3. SEM-EDX monograph of MACFBL (a) before and, (b) after fluoride adsorption.

4.6. Effect of the contact time

The impact of the contact time on MACFBL was considered by varying the contact time from 30 min to 300 min for 2mg/l -10 mg/L fluoride concentrations by keeping other adsorption parameters constants (Figure 4). Adsorption of fluoride started at 30 min with 51.50 % and reached 86.50% at 150 min and the amount of fluoride adsorbed was 0.360 mg/g. No major improvement in the adsorption of fluoride was detected after 150 min. The underlying fast rate of adsorption of fluoride was might be due to the existence and of the availability of the extensive surface of the adsorbent material for fluoride particles present in the aqueous solution. The later moderate fluoride adsorption rate was might be because of the electrostatic obstruction due to already adsorbed fluoride ions and moderate pore diffusion of the particles [35,36]. So up to the contact time of 150 min the 86.50 % fluoride adsorption happens and after 150 min, the adsorption was expanded but the rate of adsorption was moderate as compared with the early rate of adsorption and the equilibrium point was occurred after 300 min. As a result, the minimum contact time for maximum fluoride reduction on the MACFBL adsorbent material was set at 150 minutes. A similar interpretation was achieved for the fluoride removal for initial concentrations of fluorides of 4mg/L, 6mg/L, 8 mg/L, and 10mg/L, but, there was a decline in per cent removal efficiency of fluoride.

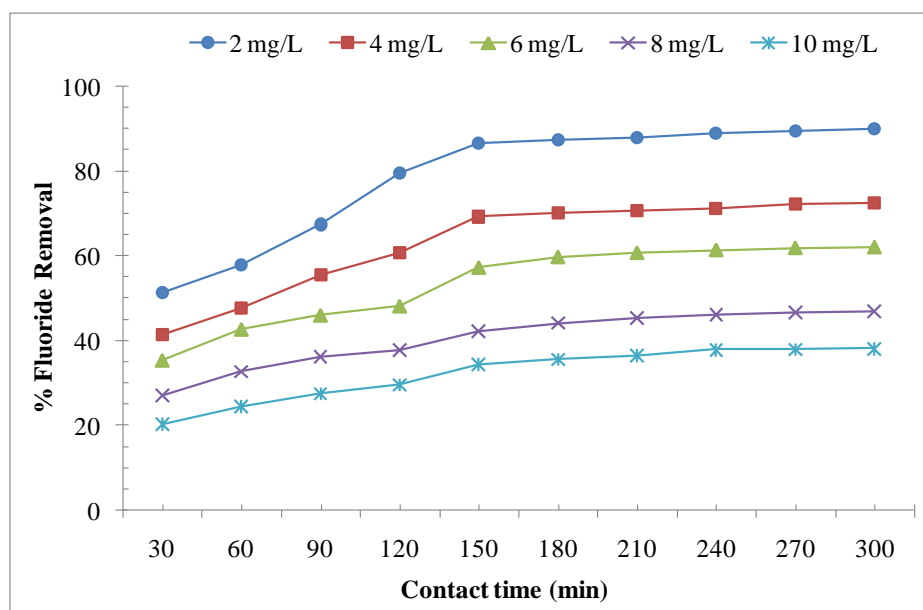


Figure 4. Effect of contact time on the fluoride adsorption by MACFBL.

(pH: 5, adsorbent dosage: 5 g/L, agitation speed: 120 strokes/min, initial fluoride concentration: 2 - 10 mg/L, temperature: 303 K)

4.7. Kinetics study for fluoride adsorption

The kinetic examination into the adsorption of fluoride from water plays an important role since it gives a significant understanding into the response pathways and mechanisms of the adsorption process of fluoride. With pseudo first-order, pseudo second-order, Intra-particle diffusion and Elovich models, the potential rate-restricting strides and probable kinetic mechanism of the adsorption of fluoride on MACFBL carbon material were investigated. Table 1 describes the observed kinetic equations and kinetic parameters of adsorption kinetic models for fluoride removal.

4.7.1. Pseudo first-order kinetic model for fluoride adsorption

Figure 5 presents a plot of $\log(q_e - q_t)$ against t . The plot shows a straight line for the first-order kinetics process, and Table 3 shows the outcomes of the fluoride adsorption on MACFBL. Using equation 3, the pseudo first - order rate constant (k_1) and the equilibrium adsorption power (q_e) were determined at different fluoride concentrations along with the correlation coefficients (R^2). The first-order rate constant (k_1) values are extending from 0.520 to 0.620 min^{-1} over the fluoride concentration range from 2 mg/L to 10 mg/L. A wide dissimilarity involving between the theoretical values and experimental values of equilibrium fluoride adsorption capacity, q_e , is seen from the kinetic results (Table 3) in the fluoride concentration range (2 mg / L-10 mg / L), suggesting weak applicability of the pseudo first - order kinetic model to the experimental results.

4.7.2. Pseudo second-order kinetics model for fluoride adsorption

The pseudo second-order kinetic model parameters of fluoride adsorption were estimated by utilizing empirical equation 4. The linear plot of t/q_t against t at various fluoride concentrations (from 2 mg/L to 10 mg/L) is made known in Figure 6. The second-order rate constant (k_2) for fluoride adsorption, and the equilibrium fluoride adsorption capacity (q_e) are calculated from the plot of t/q_t against t . Table 3 describes the respective approximate parameters of the second order kinetic model. It is evident from the kinetic results that, relative to the pseudo-first - order kinetic model, the pseudo-second - order kinetic model displayed excellent linearity with admirable correlation coefficient

values ($R^2 > 0.992$) at the fluoride concentration tested. With only minor variations, the q_e values calculated from the second-order kinetic plots are incredibly similar to the experimental values of q_e . This demonstrates that the mechanism of fluoride adsorption fits the kinetic pseudo second - order relation. The pseudo second-order fluoride adsorption rate constant, k_2 , values ranging in between $0.322 \text{ gm}^{-1}\text{min}^{-1}$ to $0.899 \text{ gm}^{-1}\text{min}^{-1}$.

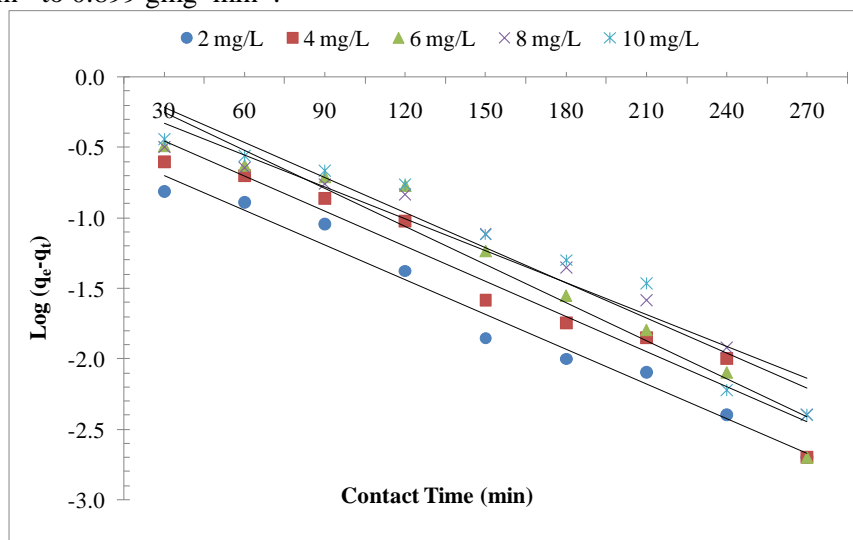


Figure 5. Linear Plots of the Pseudo first-order kinetic for fluoride adsorption on to MACFBL.

4.7.3. Intra-particle diffusion model for fluoride adsorption

The relationship based on the elimination of contaminants from aqueous solution was examined using the Weber-Morris intra-particle diffusion model. The linear plot results (Figure 7) obtained by the use of equation 5 and Table 3 refer to the external take-up of the surface. It may suggest that intra-particle diffusion was involved in the adsorption of fluoride on the surface of MACFBL. Based on these findings, but it was not the sole rate-determining step and that during fluoride adsorption, various other system processes often took part. The kinetic plot in the present case shows reasonably high rate coefficients and also better linearity. The comparative pattern has been reported for fluoride adsorption of fluoride by researchers [36, 37, 38].

4.7.4. Elovich kinetic model for fluoride adsorption

In order to validate the suitability of the Elovich kinetic equation (Figure 8 and Table 3), the adsorption of the fluoride from the aqueous solution into the MACFBL carbon material, a linear plot of q_t versus $\text{Log } t$ at various contact time for the removal of the fluoride is examined. From the intercept and slope of the linear plot, the parameters of the Elovich kinetic constants A and B were estimated. The correlation coefficient values ($R^2 = 0.937\text{-}0.984$) over the initial fluoride concentration range for the Elovich equation indicate that fluoride diffusion fits the kinetic process proposed by the Elovich model and the rate-deciding step is the diffusion in nature [39]. In fluoride adsorption to the surface of MACFBL adsorbent material, this diffusional rate-limiting mechanism is more clearly identifiable.

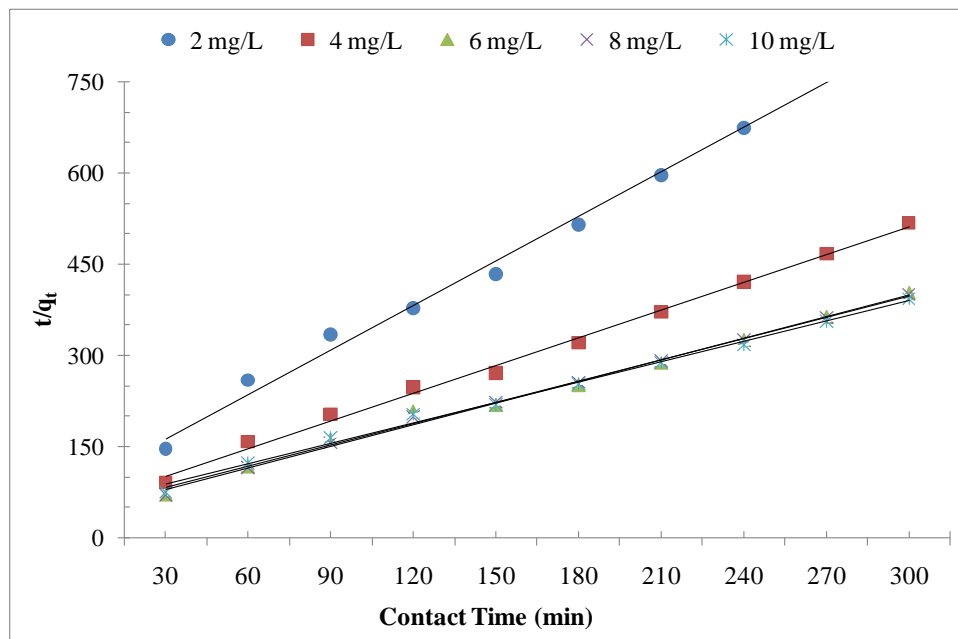


Figure 6.Linear plots of the Pseudo second-order kinetic for fluoride adsorption on to MACFBL.

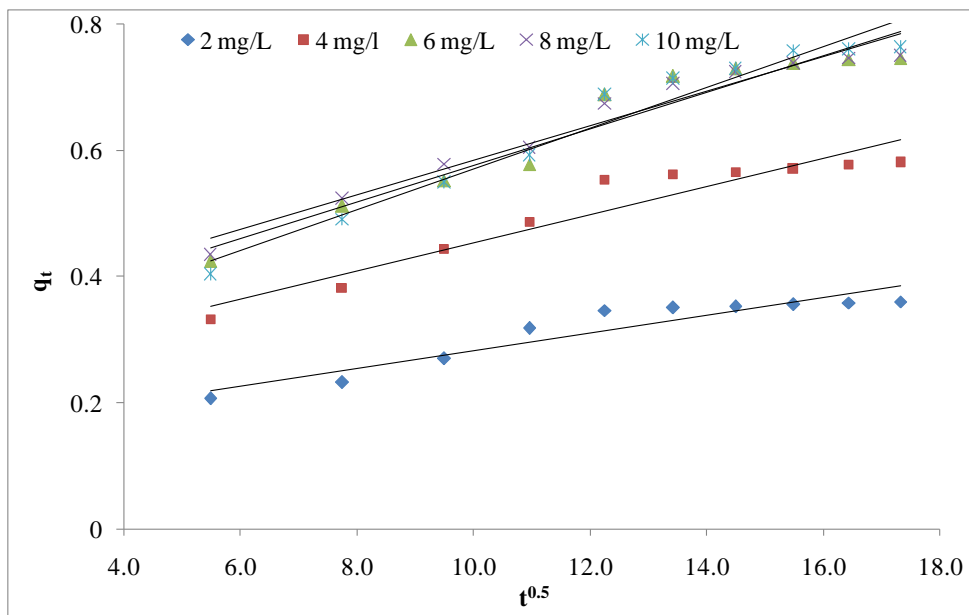


Figure 7.Linear plots of the Intra-particle diffusion model for fluoride adsorption on to MACFBL.

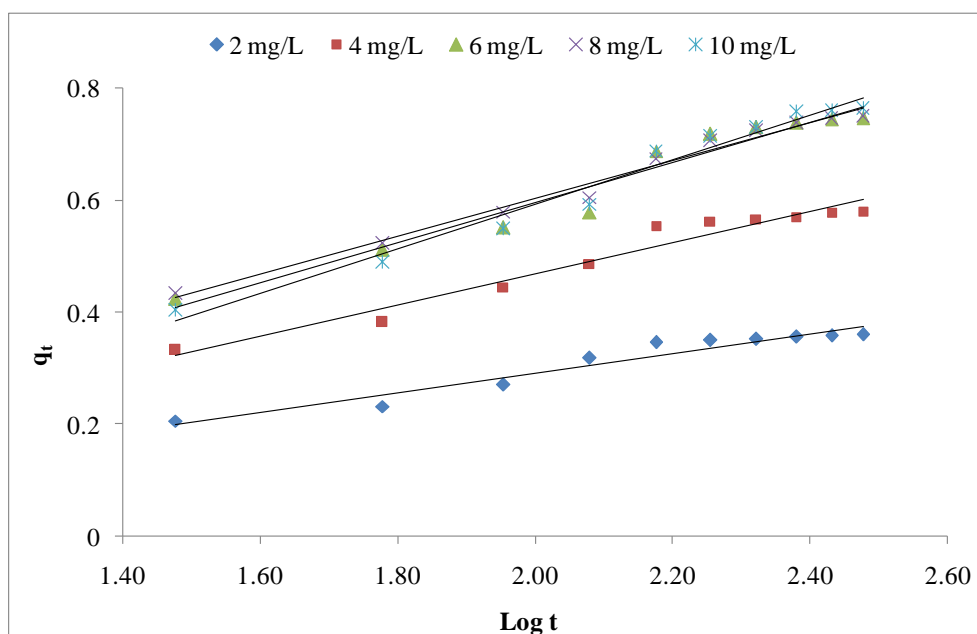


Figure 8. Linear Plots of the Elovich kinetic model for the fluoride adsorption on to MACFBL.

4.8. Effect of temperature on fluoride adsorption

The analysis of the impact of temperature variation is significant in order to find out the viability of the fluoride adsorption process. The impact of temperature on the evacuation of the fluoride using MACFBL material was examined by performing the adsorption experiments at four different temperatures 303, 313, 323 and 333 K, by keeping other parameters constant for initial concentration of the fluoride from 2 mg/L to 10 mg/L. The fluoride adsorption potential was found to decrease from 0.360 mg/g to 0.272 mg/g with an initial fluoride concentration of 2 mg/L as the temperature increased from 303 K to 333 K. (Table 4 of Figure 9). Comparative patterns were found for higher fluoride concentrations. This indicates that the mechanism of the fluoride adsorption is an exothermic process [40]. It is seen in Figure 3.21 that low temperatures favour the elimination of fluoride. This may be due to the tendency for the fluoride ions to break apart with an expansion of the aqueous solution temperature from the solid phase to the bulk phase [36, 40].

4.9. Thermodynamic study

Thermodynamic parameters such as free energy change (ΔG), enthalpy changes (ΔH) and entropy change (ΔS) can be calculated by using equations (7), (8), (9) for the thermodynamic analysis to learn the feasibility of the adsorption of fluoride. In order to discover the values of ΔS and ΔH from the slope and intercept (Figure 10), a linear plot of $\text{Log } K$ versus $1/T$ can be applied. Table 4 displays the Gibbs free energy (ΔG) for the adsorption of fluoride on MACFBL carbon content at all temperatures. The outcomes of the thermodynamics investigation describe the estimated values of ΔH , ΔG , and ΔS . The negative values of enthalpy change have shown the exothermic and random existence of the mode of adsorption [41], and the negative values of entropy change have shown that the process of adsorption is enthalpy-driven [41]. For the lower temperatures and lower fluoride concentrations, the ΔG values observed in the present sample were negative. The change in free energy (ΔG) values was positive as the temperature expanded and the adsorption turned out to be less ideal. The present research showed that at a lower temperature, the fluoride adsorption mechanism was more favourable

and feasible. Comparable negative and positive estimates of ΔG for adsorption of fluoride on various adsorbents have been reported by researchers [41, 42].

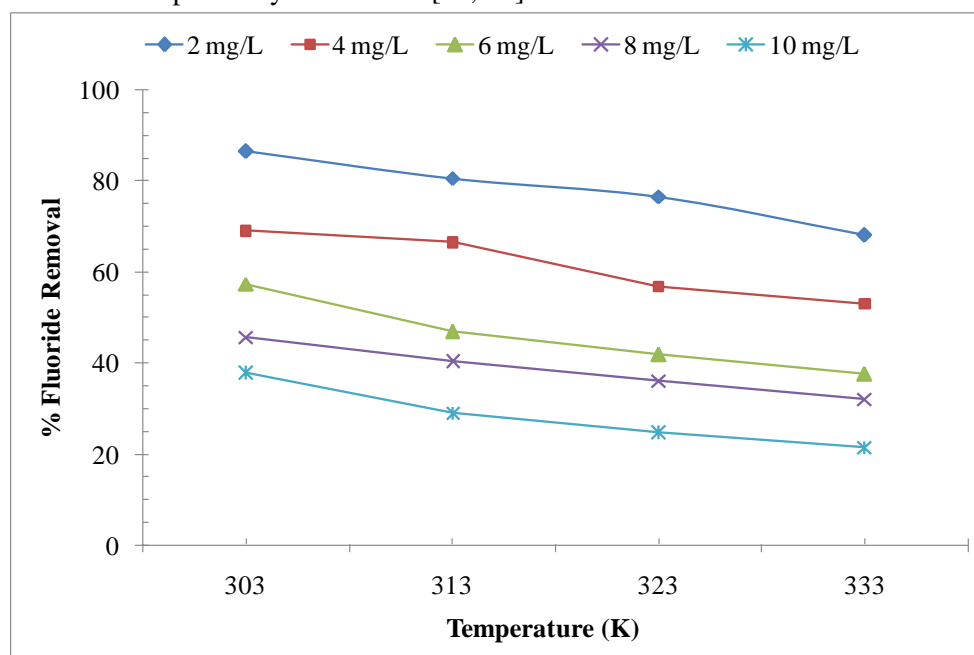


Figure 9. Effect of the temperature on the fluoride adsorption by MACFBL. (pH: 5, adsorbent doses: 5 g/L, agitation speed; 120 strokes/min, contact time : 150 min, fluoride concentrations : 2 – 10 mg/L)

Table 3. Kinetic parameters of fluoride adsorption on MACFBL

Kinetic model	Kinetic parameters	Initial concentrations of fluoride (mg/L)				
		2	4	6	8	10
Pseudo-first-order	q_e (mg/g) [Plot]	0.352	0.621	1.035	0.787	1.064
	q_e (mg/g) [Expt.]	0.360	0.580	0.746	0.750	0.764
	k_1 (min^{-1})	0.567	0.573	0.620	0.520	0.571
	R^2	0.978	0.953	0.943	0.947	0.925
Pseudo-second-order	q_e (mg/g) [Plot]	0.354	0.591	0.735	0.758	0.761
	q_e (mg/g) [Expt.]	0.360	0.580	0.746	0.750	0.764
	k_2 (g/ mgmin)	0.899	0.515	0.377	0.397	0.322
	h (mg/ g min) (10^{-1})	0.113	0.180	0.210	0.228	0.187
	R^2	0.994	0.995	0.992	0.997	0.994
Intra-particle diffusion	k_d (mg/g $\text{min}^{0.5}$)	0.014	0.220	0.029	0.027	0.032
	C	0.142	0.231	0.284	0.310	0.247
	R^2	0.887	0.912	0.935	0.917	0.958
Elovich	A (mg/g min (10^{-1}))	0.349	0.583	0.718	0.892	0.534
	B (g/mg)	13.160	8.314	6.433	6.813	5.801
	R^2	0.937	0.954	0.952	0.984	0.973

$$\Delta G = -R T \ln K \quad (7)$$

$$\Delta G = \Delta H + T \Delta S \quad (8)$$

$$\ln K = \frac{\Delta S}{R} - \frac{\Delta H}{R T} \quad (9)$$

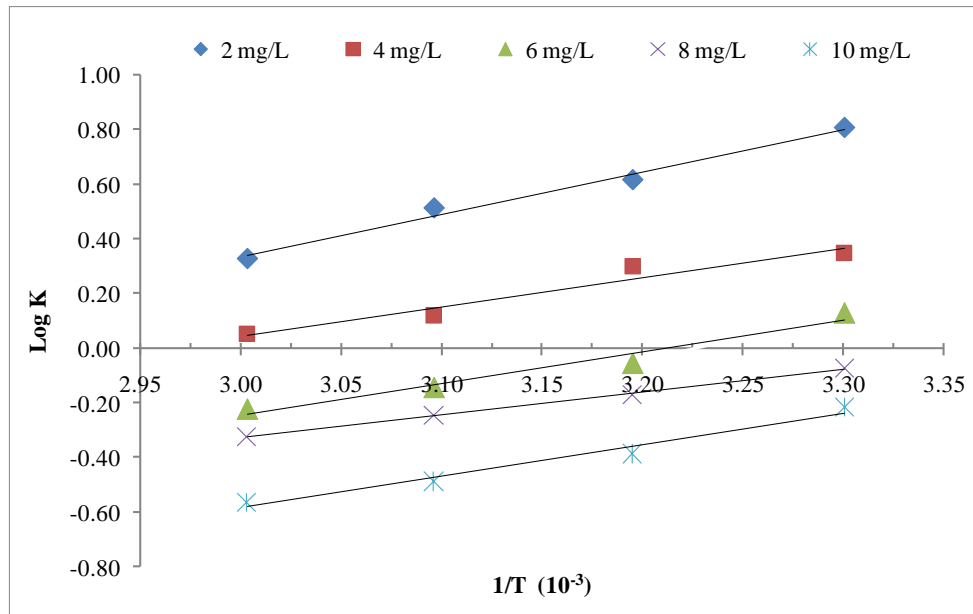


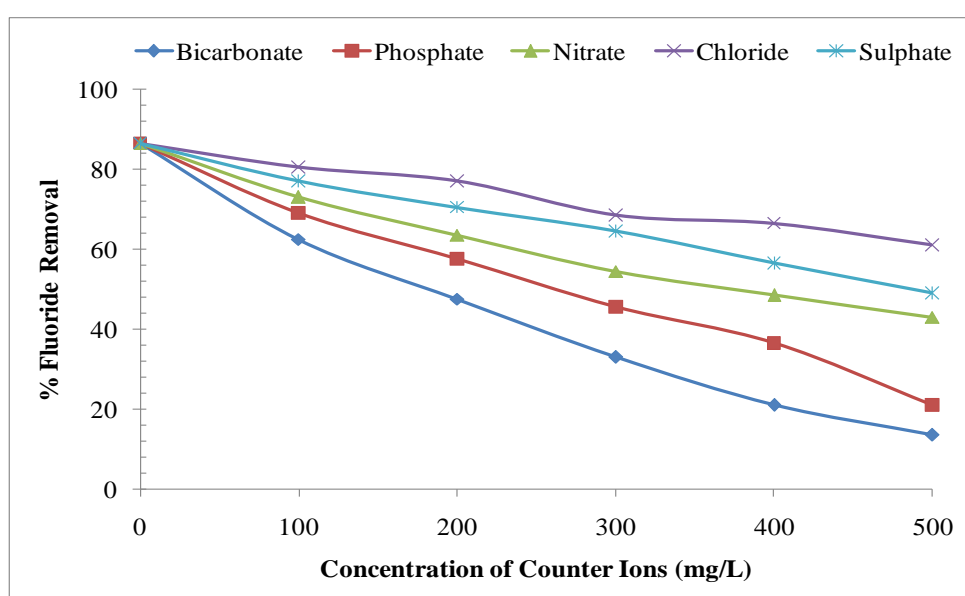
Figure 10. Linear plots of Log K against 1/T for fluoride adsorption by MACFBL.

4.10. Effect of counter anions on fluoride removal

Removal of fluoride was performed experimentally in the presence of typical counter ions, such as sulphate, bicarbonate, chloride, nitrate, and phosphate, which are normally found in water. The counter ion concentration ranged from 0 to 500 mg/L at an initial dosage of 2 mg/L at a set pH 5 and a contact time of 150 min at a dosage of 5 g / L, retaining an agitation speed of 120 strokes / min at a temperature of 303 K. Figure 11 showed that there was a significant effect on the removal of fluoride in the presence of these counter ions. The presence of bicarbonate and phosphate ions, however, resulted in a drop in the fluoride removal percentage. This may be a direct result of the opposition of these counter ions with fluoride for adsorption sites [43, 44]. The unique selective nature of the adsorbent material depends on the various properties of the counter ions such as polarizability, size, electronegativity difference charge of ions, etc. [45, 46]. The descending hindrance observed for different counter ions for removal of fluoride onto MACFBL material is in the following order, Bicarbonate > Phosphate > Nitrate > Sulphate > Chloride.

Table 4. Thermodynamic properties for adsorption of fluoride onto MACFBL

C_o (mgL ⁻¹)	ΔH (kJ mole ⁻¹)	ΔS (kJ mol ⁻¹ K ⁻¹)	ΔG (kJ mole ⁻¹)			
			303 K	313K	323 K	333 K
2	-29.754	-0.082	-4.680	-3.690	-3.170	-2.087
4	-20.544	-0.061	-2.016	-1.784	-0.729	-0.332
6	-22.095	-0.071	-0.744	0.330	0.885	1.414
8	-16.007	-0.054	0.429	1.028	1.530	2.071
10	-21.961	-0.077	1.265	2.317	3.008	3.586

**Figure 11.** Impact of Counter anions on fluoride removal ability of MACFBL

(pH: 5, adsorbent doses: 5 g/L, agitation speed: 120 strokes/min, contact time: 150 min, temperature: 303 K, fluoride concentrations: 2 – 10 mg/L)

4.11. Desorption Study

A desorption or regeneration study is also essential since it is valuable in the recycling of the MACFBL material and recovery of the fluoride. Desorption of fluoride utilizing with 0.1 & 0.2 mol/L of NaOH, KOH and Na₂CO₃ alkali solutions was considered for the investigation. The desorption arrangement was operated at the optimum condition based on the batch experiment results. 50 ml test solution was taken from the effluent during desorption study and estimate for fluoride by using an ion-selective method. Figure12, demonstrates the increase in desorption from 0.1M to 0.2 M alkali solutions. Results indicate that 0.2 mol/L alkali solutions regenerate fluoride-rich carbon up to 69.5 – 62.5 %. It was found that the MACFBL carbon material has been effectively regenerated with alkali solutions [47-50].

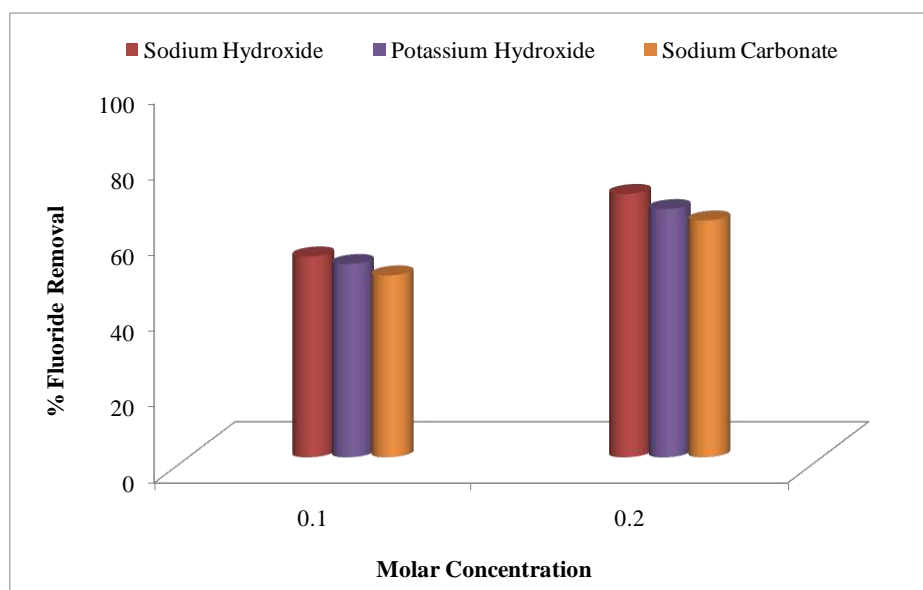


Figure 12. Desorption ability of MACFBL using alkali solutions.

(pH: 5, adsorbent doses: 5 g/L, agitation speed: 120 strokes/min, contact time; 150 min, temperature: 303 K, fluoride concentration: 2 mg/L)

5. Conclusion

In the current investigation, a new chemically impregnated carbon material from leaves of *Ficus benghalensis* (MACFBL) has been developed for expulsion of fluoride from synthetic solution of fluoride. The adsorbent material could be simply prepared from leaves *Ficus benghalensis* that are locally available everywhere. It has developed as an efficient, porous and economically reasonable carbon material which demonstrated the highest percentage removal of fluoride i.e. 86.5 %. The developed microwave treated and chemically activated adsorbent material (MACFBL) was characterized to investigate properties of adsorbent material by proximate analysis like bulk density, volatile matter, ash content, moisture content, water and acid soluble matter, and fixed carbon; ultimate and instrumental analysis like C, H, N, S element analysis, BET surface analysis, SEM, FTIR, EDX and XRD study. The characterization results show tremendous adsorbent properties for MACFBL carbon material. The fluoride adsorption rate was additionally examined with pseudo first-order model, pseudo second-order, Intra-particle diffusion, and Elovich kinetic models. The experimental finding was found to suit superior to pseudo second-order over other kinetic models. Thermodynamic investigation shows that fluoride adsorption favours at the lower temperature and the adsorption of fluoride was spontaneous, feasible and exothermic. Finally, it was concluded that MACFBL carbon material has adequate potential to extract fluoride from water and also 69.50 % fluoride can be recovered from the adsorbent surface by using a 0.2 M NaOH solution.

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SYNTHESIS AND STUDIES OF SPECTROPHOTOMETRIC ABSORPTION, LIGHT AND WASHING FASTNESS ACTIVITIES OF ORTHO, META AND PARA NITROPHENYL AZO DYES DERIVATIVES

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ABSTRACT

In present article, the synthesis of simple azo dyes derivatives from nitrobenzene and alkaline β -naphthol and its applications on polyfibres are described. Azo dyes are widely used colorants in consumer products such as leather, textile, and cosmetics and in laboratories. The absorption maxima depend upon the substituents in the diazo components of dyes. Fabric was successful with synthetic dyes. All the disperse azo dyes were applied on polyester and cotton textile fibres. Azo dyes are strongly coloured compounds which can intensify yellow, Red and Orange colours depending on the exact structure of the molecules. The dyed fabrics showed molecule to very good light fastness and washing fastness properties. Different absorption spectra obtained for the dyes with different position of substituents. Also different position of substituents on components of dyes gives different shades on the fibres.

Key Words: Azo Dyes, Spectrophotometer, Absorption, Washing Fastness, Fibres

INTRODUCTION

Fibre reactive azo dyes show a high wet fastness because of their stronger with fabric in the form of covalent bond. The chromophoric groups like NO_2 , Azo shows effect on the colour of the dyes¹. We have tried to prepare simple azo dyes, having $-\text{NO}_2$ group is present at the Ortho, Meta, and Para position of the reactive dyes obtained. The position of the $-\text{NO}_2$ group in the dye affects the colouring property of dyes. Azo dyes especially those having nitro group are found to have mutagenic².

These nitro groups lead to toxicity in methanogenic granular sludge³. The present paper reports on the synthesis of three azo dyes compounds. Three substituted i.e. O, M & P components used as colouring compounds with alkaline β -naphthol to give three azo dyes for comparison purpose⁴. These azo dyes were applicable to polyester fibres and their fastness properties were evaluated⁵.

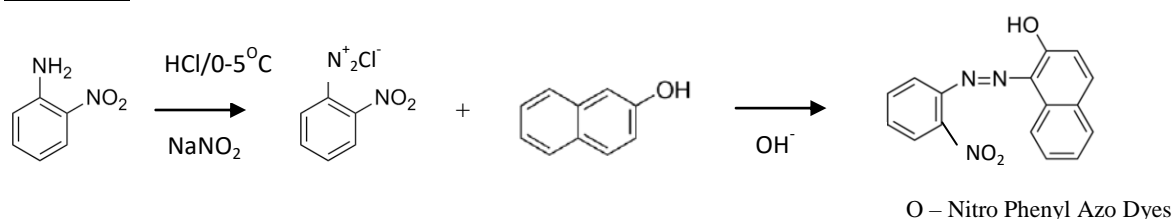
These dyes show excellent dye bath exhaustion and fixation on the polyester fibres and very good light fastness and washing properties⁶. These dyes were applied to polymer fabric by the HT method and exhibited good levelling, wash and sublimation fastness and moderate light fastness⁷. Ortho, Meta and Para phenyl azo dyes and their metal complexes with chromium and cobalt salt synthesised showed dyeing protein polyamide fibres with excellent light and wash fastness⁸. These dyes derivatives were prepared by coupling with alkaline β -naphthol

have moderate dyeing resistance on wool and polyamides⁹. The present study focus on the possibility of new dyes derivatives with good colouristic and application properties¹⁰.

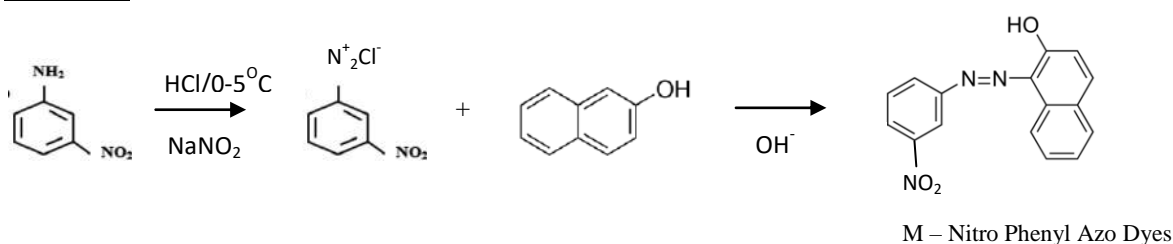
MATERIALS AND METHODS

All the chemicals used in the laboratories were A.R. grade and purified by crystallization. Purity were checked by determining melting point of the compounds. In a typical procedure, O-nitroaniline which is diazotised by alkaline β -naphthol and Sodium nitrite solution added to get the product O-nitrophenylazo dyes¹¹. Similarly by simple method M-nitroaniline and alkaline β -naphthol with sodium nitrite in cold condition M-nitrophenyl azo dye was prepared. Also, P-Nitrophenyl azo dyes were prepared by similar method. So we get the O, M and P-nitro derivatives of the azo dyes as shown in Scheme 1, 2 and 3..

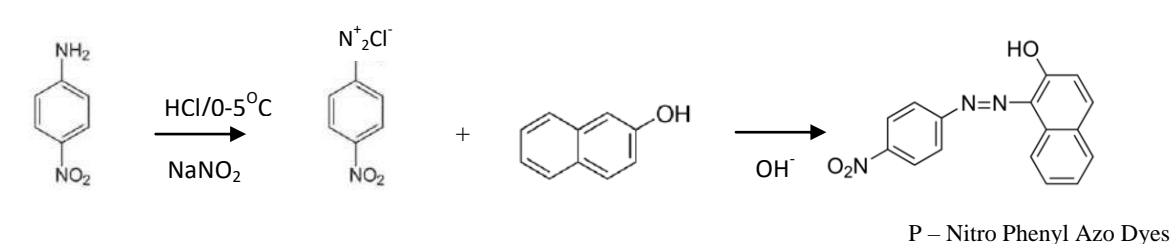
Scheme 1



Scheme 2



Scheme 3



Preparation of Dye Bath and Dyeing: The 40 mg dye was dissolved in minimum quantity of solvent to 250 ml of conical flask containing solution of dispersing agent in 100 ml of distilled water to obtain fine aqueous dispersion of the dye with continuous stirring of the solution.

Dyeing: The dye bath was set to 60°C for 20 minutes. Cotton fabric and Polyester fabric was then introduced in the dye bath. Raise temperature to 77 °C to 130 °C. After one hour of dyeing removes the fabric wash with cold water. Thus, the dyed Cotton or polyester fabric the rinsed and scoured in a detergent solution at 25°C for 30 minutes. The dyed cotton and polyester fabric pattern was rinsed and again air dried.

Cotton and Polymer Treatment: Cotton and polyester fabric was introduced into a conical flask containing distilled water. Half the portion of the flask immersed into a thermostat bath. The temperature is increased up to 80 °C for 15 minutes. The cotton and polyester fabric removed, squeezed well and dried, it is now ready to use for dyeing.

SYNTHESIS

O-, M- or P-Nitro aniline was taken in the conical flask. Then, 2.6 g of the given compound, 0.7 g of sodium carbonate and 25 ml water was taken in the flask, mixed well, and then allowed to cool in the ice bath at 5°C. A solution of 1.09 g sodium nitrite in 10 ml water added in the flask. Solution of 3 ml Conc. HCl and 15 gm of ice with 10 ml water added with constant stirring. 1.8 g of β -naphthol was dissolved in 10 percent of NaOH solution. It is then added with constant stirring in the conical flask. Dye was obtained, crystallised, filtered and dried. So, three different O, M, and P phenyl azo dyes obtained as presented in Fig. 1, 2 and 3.¹²



Fig. 1: Ortho azo dye



Fig. 2: Meta azo dye



Fig. 3: Para azo dye

RESULT AND DISCUSSIONS

Orthonitroaniline, metanitroaniline and paranitroaniline were used as the diazo components. The synthesis pathway for diazotization reaction and subsequent coupling with alkaline β -naphthol is shown in the scheme-1, 2 and 3. The structures of three azo dyes were characterised. The melting point of the azodyes was relatively close to each other. Thus, they are relatively high melting point azo dyes. In ortho-nitrophenyl azo dyes, the variation of concentration of β -naphthol gives variation in the colour of dyes. This can be analysed determining absorption spectra.

Similarly, absorption spectra by photoelectric colorimeter¹³ were recorded for M-nitro and P-nitrophenylazo dyes with different quantity of β -naphthol were recorded. Ortho-Nitro phenyl azo dye gives brick red colour on the fibre. Meta-nitrophenyl azo dye gives orange colour on the fibre. While p-Nitro phenyl azo dye gives red colour on the fibre.

Table 1: For O-Nitro phenyl Azo dyes at $\lambda_{\max}= 480$ nm

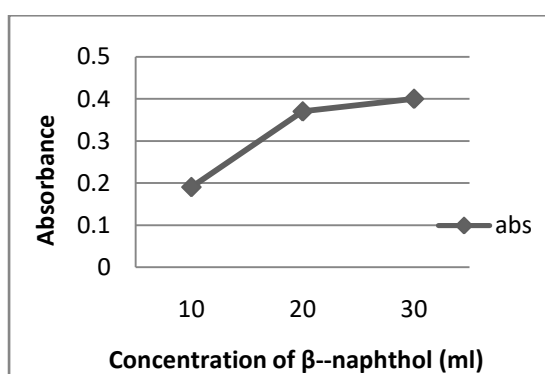
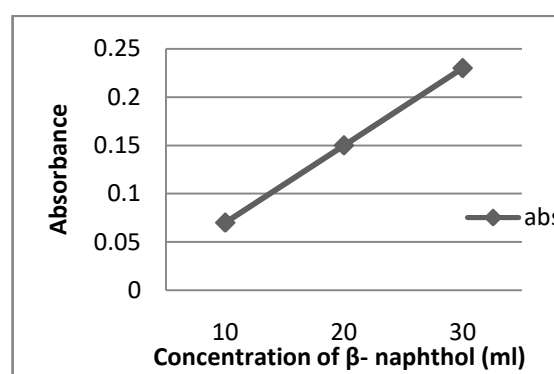
Sr. No.	Vol. of β -naphthol	Absorbance	Dyeing % on Cotton	Dyeing % on Polyester	Scale of fastness	Light fastness	Washing fastness
1	10 ml	0.19	41	32	10	9/10	10/10
2	20 ml	0.37	72	61	10	8/10	9/10
3	30 ml	0.40	91	79	10	7/10	8/10

Table 2: For M-Nitro phenyl azo dyes at $\lambda_{\max}= 480$ nm

Sr. No.	Vol. of β -naphthol	Absorbance	Dyeing % on Cotton	Dyeing % on Polyester	Scale of fastness	Light fastness	Washing fastness
1	10 ml	0.07	30	32	10	8/10	10/10
2	20 ml	0.15	45	61	10	6/10	9/10
3	30 ml	0.23	91	60	10	6/10	9/10

Table 3: For P-Nitro phenyl azo dyes at $\lambda_{\max}= 480$ nm

Sr. No.	Vol. of β -naphthol	Absorbance	Dyeing % on Cotton	Dyeing % on Polyester	Scale of fastness	Light fastness	Washing fastness
1	10 ml	0.17	35	45	10	7/10	9/10
2	20 ml	0.23	55	65	10	6/10	9/10
3	30 ml	0.27	85	80	10	5/10	8/10

**Fig 4:** Plot of concentration of β -Naphthol v/s absorbance at 480 nm**Fig 5:** Plot of concentration of β -Naphthol v/s absorbance at 480 nm

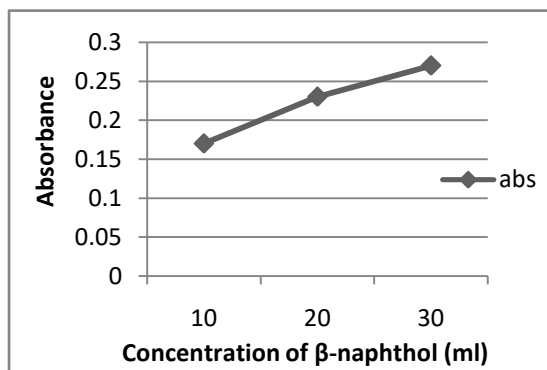


Fig 6: Plot of concentration of β -Naphthol v/s absorbance at 480 nm

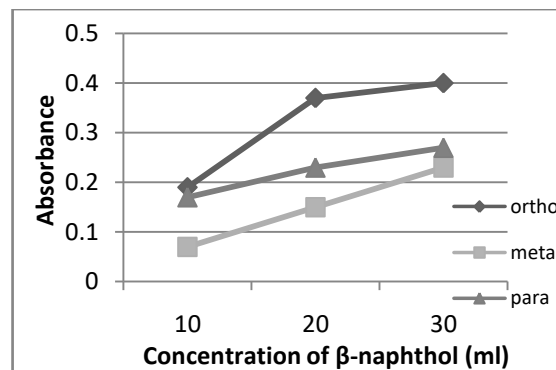


Fig 7: Plot of concentration of β -Naphthol v/s absorbance of Ortho, Meta & Para azo dye at 480 nm

Spectrophotometric Absorption Spectra: The absorption spectra of the O-azo dyes were obtained for solution (0.1 g in 100ml) prepared. From the spectra the value of λ_{\max} at 480 nm and the absorption spectra recorded. The maximum absorbance at 30 ml of β -Naphthol was observed as compare to 10 and 20 ml of β -naphthol. This indicates more amount of β -naphthol produces high intensity colour dye. The same has been shown by plotting the graph between concentrations of β -Naphthol versus absorbance¹⁴. High value of absorbance indicates the more intensity of the colour of the dye. Similar observation was recorded for M-azo dyes for different concentration of β -Naphthol while spectra for P-azo dyes were slightly differ.

Wash Fastness properties: It has been observed that O-azo dyed fabric when treated with different detergents does not show any significant changes. The result of the wash fastness tests for three dyes derivatives was observed. It shows good to excellent wash fastness. This indicates that azo dyes have affinity for the cotton and polyester fibres¹⁵.

Light fastness Properties: The O-azo dyes on exposed to UV light with variation at time for 1 hour, 2 hour and 3 three hour shows no considerable changes was observed. This indicate o-azo dyes shows moderate light fasten activity was moderate to good¹⁶. Also, it observed that more concentration of alkaline β -Naphthol gives deep colour on the cotton fabrics. O-Nitrophenyl azo dyes produce deeper colour on the fabrics than Meta and Para dyes.

CONCLUSION

This paper explain the synthesis and study of azo disperse dyes compound derivatives from ortho, meta and para nitro aniline with alkaline β -naphthol to produce three different azo dyes and their effect on cotton and polyester fibres. Absorption study by spectrophotometer were carried out shows that maximum absorbance at 480 nm for O-azo dyes. The colour parameter of dyed fabric was measured and the azo dyes have excellent absorption, intense and very good fastness properties on cotton fabrics. Result of washing fastness suggested that O-azo dyes have high affinity for the cotton fibres. Light fastness of

the dyes shows very good and moderate performance, particularly O-azo dyes. Maximum absorbance of O-azo dyes indicates it has deepened in colour than meta and para azo dyes derivatives.

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CSR Law in India : Interpretations of Legal Provisions Under the Companies Act, 2013 and its Implications

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Abstract:

The paper in overall discusses CSR Law in India. It begins with the definitions of CSR and its importance to business. Further the paper has also interpreted the various provisions of section 135 and Schedule VII of the Companies Act, 2013 as amended from time to time along with Companies CSR Rules 2014 with its amendments. The paper also discusses the implications of mandatory CSR Law in India.

Keywords: CSR, CSR Law, Companies Act 2013, CSR Rules 2014, mandatory CSR

Introduction:

Corporate social responsibilities in recent era are emerging as a strategic tool in Indian corporate sector that must be aligned with core business practices. Divesh Goyal (2018) Company is a social institution having duties and responsibilities towards the community in which it functions. Its objective is to bring about maximization of social welfare and common good. The emergence of adoption of corporate social responsibility as a business practice has various reasons. But the fact is that, unless and until it is directed by the Government to adopt such practices, the corporate sector in India was not at interest to look on it. It is a matter of debate whether the adoption of Corporate social responsibility practices and its alignment with the core business practices does enhance the corporate image that ensures the growth of the company or not. Or whether adopting the corporate social responsibility practices for doing societal goods does have a significant impact or not. At the same time it is also fact that, various researches has given various viewpoints.

In India, with the enactment of New Companies Act 2013 the Government trying to bring developmental changes in the overall corporate functioning and brought out the new section 135 which deals with the Mandatory CSR for every Companies specified in that section. Sharath R. (2018) CSR laws are meant to help in transferring excess capital from the haves to the have-nots via acts of charity. The various researches observed that, the corporate social responsibility must be rooted in the heart of company and it should not be just spending some amount of money in the form of charity.

The true social responsibility of the company must be wealth maximization through responsible business practice. The corporate used the various resources and transform it into a goods and services. Optimum utilization of resources by way of social responsible business practices shall be the outcome corporate social responsibility. The charity does not satisfy the criteria of good business practices.

India is a first country who made CSR mandatory to every company with effect from financial year 2013 and before enactment of the companies act 2013 it was voluntary for which two National voluntary guidelines issued by the Ministry of Corporate affairs, government of India.

CSR with different names: Sustainability, Corporate responsibility, triple bottom line, creating shared value, ESG, Corporate accountability, responsible investment, responsible business, corporate sustainability, corporate citizenship

Legal Provisions and Interpretation of section 135 and 135 of Companies Act 2013:

Eligible Companies: it is observed that, as per provision of sub section 1 of section 135, every company fulfills the criteria of net worth of rupees five hundred crore or more, or turnover of rupees one thousand crore or more or a net profit of rupees five crore or more during any financial year are eligible. It is further observed that, there were more than fifteen thousand companies in India existed at the time of introduction and implementation of the Companies Act, 2013. However, based on the report of HLC of MCA 2018, only 9418 companies have adopted CSR Policy and reported the same.

The number of eligible companies has been increased to more than twenty thousand in the year 2018 out of which only ten thousand companies have adopted the CSR and reported the same.

The term 'every company' includes holding & subsidiary, Every Foreign company defined under section 2(42) of the Act having its branch office or project office in India.



CSR Committee: Every eligible company shall constitute the CSR committee. The committee shall comprising of three or more directors, out of which at least one director shall be an independent director.

The unlisted public company and private limited company, where there is no requirement of Independent director or private limited company having only two directors can constitute Corporate Social Responsibility Committee without such director or with only two directors in case of private limited company.

In case of foreign company, the committee shall comprise of two persons, one of them shall be company's authorized person resident in India another person shall be nominated by foreign Company.

Functions of CSR Committee: the committee has been assigned the special task as regards to the CSR which includes the following:

- Formulation of Company's CSR Policy as per the indicative activities to be undertaken by the company as specified in Schedule VII of the Act
- Recommendation of the CSR Policy to the Board of Directors of the company for the approval and further process
- Recommendation of the amount of expenditure to be incurred on the activities contain in the CSR policy
- Regularly monitoring of the CSR policy of the company

CSR Policy:

CSR Policy means a guiding principles and strategy for CSR projects or programs which a company plans to undertake falling under the Schedule VII of the Act, and includes monitoring process of such projects or programs

Role of Board of Directors: The board of director's has an important role in the adoption, implementation and success of CSR policy, which importantly includes:

- Positively taking into account the recommendations made by the Company's CSR Committee with respect to CSR Policy
- Approval of the CSR policy for the company
- Disclosure of the content of the CSR policy of the Company in the Board's Report
- Making CSR Policy available to the stakeholders through Company's website or any other manner
- Ensuring that the activities as are included in the CSR policy of the company are undertaken
- Ensuring that, the Company spends required amount of 2% of the average net profits of the company made during the three immediately preceding financial years on the CSR activities

CSR Spend:

The company spends, in every financial year, at least two per cent of the average net profits of the company made during the three immediately preceding financial years.

CSR Activities:

The CSR activities shall be undertaken by the company as per its stated CSR Policy which includes projects or programs or activities (either new or ongoing) excluding activities undertaken in pursuance of its normal course of business. The Activities shall be in accordance with the Schedule VII of the act.

The act provides that, the company shall give preference to the local area and areas around it where it operates, for spending the amount earmarked for Corporate Social Responsibility activities.

Failure to spend:

Earlier Provision: As per provision of clause (o) of sub section 3 of section 135, the Boards of directors fails to spend on CSR shall specify the reasons for not spending the amount in its Boards report.

Amendments: The company shall be punishable with fine which shall not be less than fifty thousand rupees but which may extend to twenty-five lakh rupees and every officer of the company who is in default shall be punishable with imprisonment for a term which may extend to three years or with fine which shall not be less than fifty thousand rupees but which may extend to five lakh rupees, or with both.

Manner of implementation of CSR Activities:

(a) a company established under section 8 of the Act or a registered trust or a registered society, established by the company, either singly or alongwith any other company, or

(b) a company established under section 8 of the Act or a registered trust or a registered society, established by the Central Government or State Government or any entity established under an Act of Parliament or a State legislature

Provided that- if, the Board of a company decides to undertake its CSR activities through a company established under section 8 of the Act or a registered trust or a registered society, other than those specified in this sub-rule, such



company or trust or society shall have an established track record of three years in undertaking similar programs or projects; and the company has specified the projects or programs to be undertaken, the modalities of utilisation of funds of such projects and programs and the monitoring and reporting mechanism'.

Collaboration for CSR

A company may also collaborate with other companies for undertaking projects or programs or CSR activities in such a manner that the CSR Committees of respective companies are in a position to report separately on such projects or programs in accordance with these rules.

Location of Project:

The CSR projects or programs or activities undertaken in India only shall amount to CSR Expenditure.

CSR Excluded:

The CSR projects or programs or activities that benefit only the employees of the company and their families shall not be considered as CSR activities

Contribution of any amount directly or indirectly to any political party under section 182 of the Act, shall not be considered as CSR activity.

CSR capacities

Companies may build CSR capacities of their own personnel as well as those of their Implementing agencies through Institutions with established track records of at least three financial years but such expenditure [including expenditure on administrative overheads,] shall not exceed five percent of total CSR expenditure of the company in one financial year.

Schedule VII of the Act

Activities which may be included by companies in their Corporate Social Responsibility Policies Activities relating to:-

- (i) Eradicating hunger, poverty and malnutrition, promoting health care including preventive health care and sanitation including contribution to the Swachh Bharat Kosh set-up by the Central Government for the promotion of sanitation and making available safe drinking water.
- (ii) promoting education, including special education and employment enhancing vocation skills especially among children, women, elderly and the differently abled and livelihood enhancement projects.
- (iii) promoting gender equality, empowering women, setting up homes and hostels for women and orphans; setting up old age homes, day care centres and such other facilities for senior citizens and measures for reducing inequalities faced by socially and economically backward groups.
- (iv) ensuring environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agroforestry, conservation of natural resources and maintaining quality of soil, air and water including contribution to the Clean Ganga Fund set-up by the Central Government for rejuvenation of river Ganga.
- (v) protection of national heritage, art and culture including restoration of buildings and sites of historical importance and works of art, setting up public libraries, promotion and development of traditional art and handicrafts;
- (vi) measures for the benefit of armed forces veterans, war widows and their dependents;
- (vii) training to promote rural sports, nationally recognised sports, paralympic sports and olympic sports
- (viii) contribution to the prime minister's national relief fund or any other fund set up by the central govt. for socio economic development and relief and welfare of the schedule caste, tribes, other backward classes, minorities and women;
- (ix) Contribution to incubators funded by Central Government or State Government or any agency or Public Sector Undertaking of Central Government or State Government, and contributions to public funded Universities, Indian Institute of Technology (IITs), National Laboratories and Autonomous Bodies (established under the auspices of Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR), Council of Scientific and Industrial Research (CSIR), Department of Atomic Energy (DAE), Defence Research and Development Organisation (DRDO), Department of Biotechnology (DBT), Department of Science and Technology (DST), Ministry of Electronics and Information Technology) engaged in conducting research in science, technology, engineering and medicine aimed at promoting Sustainable Development Goals (SDGs);
- (x) rural development projects



- (xi) slum area development.

Explanation - For the purposes of this item, the term 'slum area' shall mean any area declared as such by the Central Government or any State Government or any other competent authority under any law for the time being in force.

- (xii) disaster management, including relief, rehabilitation and reconstruction activities.

Implications

It is observed from various researches that, most of the companies do not have adequate knowledge of public problems and policy measures. Further for companies except few, CSR is not on priorities business. Companies who are undertaking CSR have selective activities that ultimately benefit their brand. It is also fact that, companies are not very transparent in declaring their CSR income. Before implementing the law there was many companies who were regularly undertaking CSR Activities and that too with higher amount that mandated 2 percent.

Conclusion

The paper conclude that, Mandatory Corporate Social responsibility provision is new, have already been implemented but is continuously changing over a period of time. At initial state many companies was not clear about the various content of the provision but later on the government tried to make it clear through circulars and FAQs. It is concluded that, mandatory adoption and reporting will be helpful to the company in years to come.

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Bare Act

The Companies Act 2013

Corporate Social Responsibility Policy Amendment Rules, 2014 Dated 12th September 2014

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Development of e-commerce and its Impact on human life

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Abstract

Today, e-commerce is being used widely in all fields. So e-commerce are related to human life in their daily activities. Today's stressful and busy lifestyle there is no option but to use e-commerce meeting daily needs to attaining social status in society. Today in all aspects of our daily lives, the internet has become an undivided part of our lives, as it has a versatile impact on our daily social activities. Every day, going to the bank and to make cash transactions or withdraw money or go to the market to buy things and essential commodities is now quite difficult since there is no time, the human being has become too busy in his work and, so, in these circumstances, online purses have become an increasingly integral part of our society. Therefore what is e-commerce, the development of e-commerce and the impact of e-commerce on human life are discussed in details here.

Keywords : *e-commerce, internet*

The concept of e-commerce:

E-commerce is the activity of buying or selling of products on online services or over the Internet. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems.

Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle although it may also use other technologies such as e-mail. Typical e-commerce transactions include the purchase of online books and music, and to a less extent, customized online liquor store inventory services. E-commerce is supported by electronic business.

There are three areas of e-commerce:

- online retailing
- electronic markets, and
- online auctions.

According to the definition of Wikipedia is...

“A system for the buying and selling of goods and services using the Internet as the main means of exchange”.

Another words, it is a business that electronically manages both the collections and payments. E-commerce is the buying and selling of goods and services as well as the transmitting of funds or data, over an electronic network, primarily the internet.

History of e-commerce

The beginnings of e-commerce can be traced to the 1960s, when businesses started using Electronic Data Interchange (EDI) to share business documents with other companies. 1971 or 1972, the [ARPANET](#) is used to arrange a cannabis sale between students at the [Stanford Artificial Intelligence Laboratory](#) and the [Massachusetts Institute of Technology](#). In 1979, the American National Standards Institute developed ASC X12 as a universal standard for businesses to share documents through electronic networks. And [Michael Aldrich](#) demonstrates the first [online shopping](#) system. After the

number of individual users sharing electronic documents with each other grew in the 1980s. In 1981, Thomson Holidays UK is the first business-to-business online shopping system to be installed. Then the rise of eBay and Amazon in the 1990s revolutionized the e-commerce industry. Consumers can now purchase endless amounts of items online, from e-tailers, typical brick and mortar stores with e-commerce capabilities and one another. In **India**, the Information Technology Act 2000 governs the basic applicability of e-commerce. After that...

In 2000, The [dot-com bust](#).

In 2001, [Alibaba.com](#) achieved profitability in December 2001.

In 2002, [eBay](#)

In 2003, [Amazon.com](#) posts first yearly profit.

In 2004, [DHgate.com](#), China's first online b2b transaction platform, is established, forcing other b2b sites to move away from the "[yellow pages](#)" model.

In 2007, [Business.com](#) acquired by [R.H. Donnelley](#) for \$345 million.

In 2014, US e-commerce and Online Retail sales projected to reach \$294 billion, an increase of 12 percent over 2013 and 9% of all retail sales. Alibaba Group has the largest [Initial public offering](#) ever, worth \$25 billion.

In 2015, [Amazon.com](#) accounts for more than half of all e-commerce growth, selling almost 500 Million SKU's in the US.

In 2017, Retail ecommerce sales across the world reached \$2.304 trillion.

Differences between e-commerce and e-business

E-commerce is often confused with **e-business**, although they have nothing to do with one another. E-commerce only refers to the goods and services transaction between a seller and a consumer, whereas e-business refers to the complete process necessary to manage an online business, for example: Inbound marketing, Sales promotions, Stock control, SEO, Email marketing, Etc. The e-business concept is wider than the e-commerce one and e-commerce is actually a part of e-business since it is a type of business model.

Advantages of e-Commerce to Customers :

- Provide details of the virtual showcase on websites with online catalogs.
- Reduced prices due to contests (coupons and offers).
- Access and convenience 24 hours.
- The global market for the purchase or sale of the product.
- Provide secure business transactions
- It is easier to compare prices with other premium brands
- Do not stay online or be held forever
- Many options and range (options and options)
- Return products if it is of lower quality
- Time savings and reviews of easy review.

Advantages of e-Commerce to Business:

- Increase in potential market share by increasing the customer base

- Use of EDI, B2B data exchange
- Low barriers to items
- Provide safe business and instant transactions
- Participate in retail for the launch of new products and services
- 24/7, 365 days of sales (buyer and seller)
- Expanding the scope of the business
- Main warehouse administration
- Reduction of employee costs

Due to these advantages, e-commerce is very essential in human life.

Government regulations for e-commerce

In the United States, the Federal Trade Commission (FTC) and the Payment Card Industry (PCI) Security Standards Council are among the primary agencies that regulate e-commerce activities. The FTC monitors activities such as online advertising, content marketing and customer privacy, while the PCI Council develops standards and rules, including PCI Data Security Standard compliance, which outlines procedures for the proper handling and storage of consumers' financial data.

Development of e-commerce

India's e-commerce market was worth about \$3.9 billion in 2009, it went up to \$12.6 billion in 2013. In 2013, the e-retail segment was worth US\$2.3 billion. About 79% of India's e-commerce market is travel related. According to Google India, there were 35 million online shoppers in India in 2014 Q1 and was expected to cross 100 million mark by end of year 2016. CAGR vis-à-vis a global growth rate of 8–10%.

Electronics and Apparel are the biggest categories in terms of sales. According to a study conducted by the Internet and Mobile Association of India, the e-commerce sector is estimated to reach Rs. 211,005 crore by December 2016. The study also stated that online travel accounts for 61% of the e-commerce market. According to Google India Research, by 2021 India is expected to generate \$100 billion online retail revenue out of which \$35 billion will be through fashion e-commerce. Online apparel sales are set to grow four times in coming years. India's retail market is estimated at \$470 billion in 2011 and is expected to grow to \$675 billion by 2016 and \$850 billion by 2020, – estimated CAGR of 10%. According to Forrester, the e-commerce market in India is set to grow the fastest within the Asia-Pacific Region at a CAGR of over 57% between 2012–16. As per "India Goes Digital", a report by Avendus Capital, the Indian e-commerce market is estimated at Rs 28,500 Crore (\$6.3 billion) for the year 2011. Online travel constitutes a sizable portion (87%) of this market today. Online travel market in India had a growth rate of 22% over the next 4 years and reach Rs 54,800 crore (\$12.2 billion) in size by 2015. Indian e-tailing industry is estimated at Rs 3,600 crore (US\$800 million) in 2011 and estimated to grow to Rs 53,000 crore (\$11.8 billion) in 2015.

Overall e-commerce market had reached Rs 1,07,800 crores (US\$24 billion) by the year 2015 with both online travel and e-tailing contributing equally. Another big segment in e-commerce is mobile/DTH recharge with nearly 1 million transactions daily by operator websites. A new sector in e-commerce is online medicine, selling complementary and alternative medicine or prescription medicine online. There are no dedicated online pharmacy laws in India and it is permissible to sell prescription medicine online with a legitimate license. Online sales of luxury products like jewellery also increased over the years. Most of the retail brands have also started entering into the market and they expect at least 20% sales

through online in next 2–3 years. In 2017, the largest e-commerce companies in India were Flipkart, Amazon, Myntra, Paytm, and Snapdeal.

E-commerce rapid growth in internet adoption marks the shift of retailing from traditional brick and mortar to online buying and selling. E-commerce implementation and maintenance services including Omni-channel B2B & B2C portal development and platform re-engineering. its offer comprehensive, integrated e-Commerce development services for marketing, merchandising, catalogue & content management, order management & payment processing. Leveraging our strategic partnership with Magento, most popular ecommerce platform, we deliver full range of Magento development and customization as part of our e-commerce development services to create customer experience.

Mobile Enablement

Mobile technology is revolutionizing the face of retail industry today. Its help retailers deliver a seamless mobile experience to customers from browsing to checkout with mobile e-commerce development services. With vast experience in retail industry and mobile technology.

Digital Transformation

Retail industry has experienced paradigm shift in recent years with the explosion of digital technologies. Brick & mortar and online stores are undertaking plethora of digital transformation activities to stay competitive. Our technology and domain experts leverage the power of disruptive technologies such as SMAC, to embark on the digital transformation journey.

Analytics :

Retailers generate huge volumes of data at different stages of the retail lifecycle every day. To add pressure, digital savvy shoppers seek personalization and convenience. Thus, it becomes imperative for retailers to have robust data management and analytical engine to draw near-real time actionable insights and drive informed retail decisions. Nous' Analytics services help retailers analyze customers, products and omni-channel operations data across geographical markets. Retail technology solutions span critical areas of retailing including customer segmentation, assortment optimization, location based marketing, purchase pattern identification and more. We integrate data from various touch points such as POS, merchandising and supply chain systems to identify revenue and profit opportunities.

System Integration :

Retailing is characterized by various activities, starting from procurement to sales and post sales. These activities are powered by various IT systems which perform specific functions. Integrating such IT systems is very crucial in order to maintain smooth and hassle free retailing operations. We are specialized in providing System Integration services using Enterprise Service Bus architecture that enables heterogeneous systems including e-commerce, ERP, POS, CRM, CMS and WMS systems to communicate with each other.

E-commerce's Impact on human life**1. On customer :**

E-commerce brings convenience for customers as they do not have to leave home and only need to browse website online. It could help customers buy wider range of products and save customers' time.

Consumers also gain power through online shopping. They are able to research products and compare prices among retailers. Also, online shopping often provides sales promotion or discounts code, thus it is more price effective for customers. Moreover, e-commerce provides products' detailed information; even the in-store staff cannot offer such detailed explanation. Customers can also review and track the order history online. E-commerce technologies cut transaction costs by allowing both manufactures and consumers to skip through the intermediaries. However, e-commerce lacks human interaction for customers, especially who prefer face-to-face connection. Customers are also concerned with the security of online transactions and tend to remain loyal to well-known retailers. When the customer regret the purchase of a product, it involves returning goods and refunding process. This process is inconvenient as customers need to pack and post the goods. If the products are expensive, large or fragile, it refers to safety issues.

2. On employment :

E-commerce helps create new job opportunities due to information related services, software app and digital products. It also causes job losses. The areas with the greatest predicted job-loss are retail, postal, and travel agencies. The development of e-commerce will create jobs that require highly skilled workers to manage large amounts of information, customer demands, and production processes. In contrast, people with poor technical skills cannot enjoy the wages welfare. On the other hand, because e-commerce requires sufficient stocks that could be delivered to customers in time, the warehouse becomes an important element. Warehouse needs more staff to manage, supervise and organize, thus the condition of warehouse environment will be concerned by employees.

3. On supply chain management :

E-commerce has a more sophisticated level of impact on supply chains: Firstly, the performance gap will be eliminated since companies can identify gaps between different levels of supply chains by electronic means of solutions; Secondly, as a result of e-commerce emergence, new capabilities such as implementing ERP systems, like SAP ERP, Xero, or Megaventory, have helped companies to manage operations with customers and suppliers. Yet these new capabilities are still not fully exploited. Thirdly, technology companies would keep investing on new e-commerce software solutions as they are expecting investment return. Fourthly, e-commerce would help to solve many aspects of issues that companies may feel difficult to cope with, such as political barriers or cross-country changes. Finally, e-commerce provides companies a more efficient and effective way to collaborate with each other within the supply chain.

(Main article: Supply chain management)

4. On markets and retailers

E-commerce markets are growing at noticeable rates. Many larger retailers are able to maintain a presence offline and online by linking physical and online offerings. E-commerce allows customers to overcome geographical barriers and allows them to purchase products anytime and from anywhere. Online retailers often hold no inventory but send customer orders directly to the manufacture. Its base prices on the speed of delivery. Many customers prefer online markets if the products can be delivered quickly at relatively low price.

The social impact of e-commerce can be measured by satisfaction and trust through the following factors:

- This segment is the leading user of advanced applications and online technologies.
- According to a survey conducted by the Internet and Mobile Association of India, the number of Internet users in the country was 190 million at the end of June 2013.
- With more and more users on the web through telephony, it was expected that the country reached 243 million in June 2014, representing a growth of 28% over the previous year.
- The growth in the number of Internet users has also led to substantial growth in other digital industries such as e-commerce, mobile commerce, and digital advertising.
- The government of India has made efforts in the education system through the implementation of computer tools and techniques, essential for all educational levels, from primary education to the end of studies.
- Students from urban and rural areas were sensitized by supplying the personal computer, Laptops, tablets or laptops with the use of the Internet and its advantages to improve lifestyle and provide electronic books and e-books.
- Entrepreneurs are also attracted to advanced computer technologies and their usefulness for electronic commerce.
- The development of educational standards at all levels has allowed a great demand for electronic commerce and m-commerce in the market.
- Changes in online shopping habits The online shopping process is constantly being worked on to make it easier, more understandable and easier to use.

- As online offers give some discounts and attractive prices.

Also Read: [WooCommerce SEO Tips](#)

Conclusion:

E-commerce is functionally in our daily private and also international business lives. E-commerce in personal use is not much complicated and has straight borders around, but in professional business field, it has relied on serious laws & regulations (most of the time these differs by countries and/or regions). World is smaller and more accessible with e-commerce; offers reach variety of shopping & trading opportunities and will spread wider into our lives day by day. E-commerce has a wide scope, it deals with not only the activities which are related to transfer of goods & services but also with the enhancement and marketing of trade business. India is not only ready for e-commerce; e-commerce has already become essential for human life. There are many reasons which make India a suitable market for e-commerce. In the study of e-commerce it was observed that the advantages of e-commerce are more than its disadvantages therefore in today's stressful and busy lifestyle there is no option but to use e-commerce meeting daily needs to attaining social status in society.

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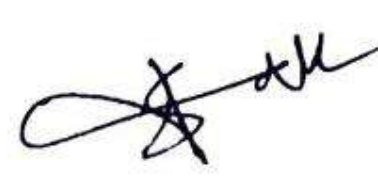


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This is to certify that Dr. /Mr. /Mrs. / Ms. **D. H. Puttewar**
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Opportunities and Challenges in E-learning in India

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Abstract :

E-learning is the modern - and technologically enhanced way - to approach distance learning. Higher education providers are becoming increasingly aware of the diversity of their current and potential learners. Teaching with technology is not a one size fits all approach as it depends on the types of technology in use at the time and also the curriculum content being taught. E-Learning covers a wide set of applications and processes such as computer-based learning systems, Web-based learning systems, virtual classrooms, and digital collaborative learning GroupWare packages. This paper focuses on the challenges and opportunities of e-learning in India.

Key Words: e-learning, teaching-learning, internet.

E-learning: Third World countries

E-Learning content is mainly delivered via Internet, intranet/extranet, audiotape and videotape; satellite broadcast. Definition of e-learning, as has been enunciated by various online dictionaries, encyclopedias - including but not limited to the very famous Wikipedia, and various



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other blogs and other research sites, explains e-learning as any learning which is done with the aid of technology and more specifically with the aid of the Internet. Therefore, the preliminary question that arises in one's mind is whether e-learning would relate necessarily to all kinds of education that is acquired on the Internet. Today, the Internet is used for the very obvious and basic purpose of networking - personal as well as professional, so also for the purposes of enhancing communication abilities, and to propel an individual forward with the aid of search engines and their ability to scan the Internet for common man. However, the very scope of Internet does not stop here. Therefore, to say that this research paper is being written for e-learning alone and not exploring the possibilities of the Internet is to turn a blind eye towards the full Moon on a cloudless night. Impossible!

When we talk of Third World countries, the picture that is pushed into our minds is that of hunger, poverty, malnutrition, et cetera. However, not many of us realize that this is not the only side of the picture. Many of the Third World countries today have moved much beyond these stereotypical images and are in fact today recognized as centers of the new Renaissance. However, even though the government's (giving all due credit to them) have been trying hard to ensure that these archaic images change, and they have also been successful to an extent, yet, when you look at the scenario in the field of education, we realise that not much has changed. One doesn't need to go too far to look into the fact that even today more than 80% of the education that is being attributed to the students (schoolchildren as well as college adolescents) is attributed at the behest of the government, which in a majority of the cases is not only incompetent but also unable to decide the curriculum. Therefore, instances where a change in the government (read : ruling party/faction) forces the change in the textbooks and curricula of the students are very common. It is sad state of affairs and the matter of shame that such instances



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are not yet sporadic and rare. Therefore, it is in these circumstances that when a Third World student decides to explore learning beyond what is offered to them by the government, the primary resource for him in such circumstances is the Internet. The consequent learning that takes place would have necessarily to be referred to as e-learning.

Therefore, whenever a student aims at completing his/her higher education in the University of world repute, then in such circumstances, the textbooks are discarded and, the computer with an Internet connection replaces even the reference books. What needs to be analyzed is as to whether this important, omnipresent God of the younger generation, who promises to help them in realising their true potential, is actually worthy of being revered as the Messiah. The very basic premise on this issue would be that the glass is half full whereas the others view it as half empty. However, if you look at it from the point of view of a student and a Third World nation, it quenches thirst. And that, is what matters as long as e-learning is concerned. Therefore, the Third World student becomes aware of all those universities/courses/diplomas which will offer a scope in the chosen subject, the number of entrance examinations which he might have to undertake to apply for those universities, and all those unnecessary and fallacious tests to which he might be subjected to (in a very derogatory manner) as the primary language of e-learning –English, is not his mother tongue. Even though, I have to agree that e-learning opens up a wide scope and helps students to spread their wings, it is this very e-learning which acts as a deterrent when it comes to learning at the local level. I state and submit this as, not many resources (compact discs, web-based resources, et cetera) are available for enhancing learning at the local level. Therefore, this new tool would be as the adage goes “a double edged sword”.



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Therefore, at the conclusion of the first aspect, I submit that e-learning is helping the students in third world countries to come forward and compete for scholarships, admissions and even otherwise at the global level, and thus, e-learning is eliminating the divide which exists on the globe today on account of the monetary resources that the country has at its disposal. There are many examples/case studies/illustrations which demonstrate this fact. Therefore, e-learning is successful and is also trying to help those who do not have access to facilities in their backyards. Hence, e-learning needs to be hailed as the new medium of education.

Objectives :

- To access the challenges of E-learning in India
- To access the opportunities of e-learning in India
- To examine the role of e-learning in effective teaching-learning.

Hypothesis :

- There is a significant impact of e-learning on the teaching-learning process.

E-learning: Lack of Acceptance in India

Even though the first aspect and part of this research paper has come to a conclusion with the sentence that e-learning needs to be hailed as the new medium of education, yet, my subsequent part of this paper deals with the challenges that e-learning is today facing in India.



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Not many of us realise that a degree or diploma for that matter, which may be procured with the help of e-learning via an institute of higher learning having great reputation, is not recognised for those purposes within the territorial boundaries of India. This, is more so due to the mindset and perception of the Indian society at large, that only those who are not able to succeed in the traditional medium and more of education resort to 'distance education'. Even though, this may not be true, yet, when we look at it today from the perspective of e-learning, it is necessary to note and point out that there does exist a vast difference and divide between distance learning and e-learning. Unless and until, this change and difference is realised, the scenario for acceptance of e-learning in India continues to be bleak.

Today, the Indians have realised the true potential of e-learning, and have moved on from merely using the Internet for the purposes of chatting and Skype towards more meaningful and constructive purposes such as subscribing to courses/seminars (often referred to as webinars)/diplomas/degree courses which are offered exclusively online. Even though, I admit that majority of these new age students are working professionals who are trying to enhance and fortify their qualifications, yet, the positive role that e-learning today has to play in their careers cannot be denied. However, in contrast to the aforesaid mentioned professional, if they looked at afresh at a novice, trying to apply for any position/seeking a job on the basis of his qualification acquired via e-learning, rather than appreciation, that individual is more likely to be rebuked and dismissed as a maverick. This mindset needs to change. On the other hand, a person possessing the same qualification, by going overseas and spending loads of money in procuring the same degree or qualification directly from a university overseas, is more likely to be accepted, even though technically speaking both of these individuals are exactly similarly placed. This change can only be fuelled by recognising the true potential of e-learning.



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Even though dangers of e-learning are many, yet, looking at it from perspective with regards to India, I have to admit that the scope is limited. Even though the world 'limited' is being used for the first time in this paper with reference to e-learning and its potential, the same is necessary and this paragraph will explore and demonstrate how it is so. As per the census reports of India, more than 30% of our population today lives in poverty and is treated by the government as being below the poverty line. It is needless to mention that such families and students belonging there to are having a very limited scope and access to e-learning. Further, even if an analysis of the remaining 70% of the population is made, then we realize that only 50% of their (35% of the total population, and that too considering it at a higher side) has access to higher education and e-learning combined. Out of this 35%, it is only a miniscule 12% of the population which is actually today using e-learning for certain benefits. Such a limited useage is not likely to be looked at in a very positive perspective by the society at large. Further, students acquiring qualifications to this medium of learning are harassed while applying for jobs in the government or semi-government sectors, by asking them to produce equivalence certificates and are asked to demonstrate that their studies /qualifications are recognized as valid by the Indian government. In fact, a couple of case studies, would reveal that maximum of these e-learning qualifications are not held to be valid by the University Grants Commission a.k.a. UGC, which is the premier body for regulating higher education in India. This happens because a majority of those institutions with the gift qualifications in the field of e-learning, are not today recognised as 'university' within the scope as defined under the provisions of Sec. 2 (f) of the University Grants Commission Act, 1956. However, to place the blame entirely on the shoulders of the Commission would be incorrect for the last amendment in the statute that governs the Commission and its working was last amended in the year 1985 when the concept of e-learning



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was as alien as is the concept of extra-terrestrial beings today. Therefore, unless and until the Indian legislature a.k.a. the Parliament amends the statute and introduces such concepts into the Indian education system officially, a change in the mindset of the employer towards the acceptance of such qualifications procured via this new medium of learning, not only is difficult but is also remote.

Therefore, what today needs to be done to enhance that acceptability of e-learning in India, is clearly spelt out. Perhaps, this step to introduce computer education to all children in primary schools and also to make education up to the primary level compulsory for all children could be taken as the first step that has been introduced by the government. But by solely relying thereon, and by not acting and enacting new and improved statutes, the government has probably failed in its duties.



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- **Adaptiveness**

One of the greatest things about elearning is that the software and technology can easily evolve according to new pedagogical theories. Everyone is talking about Gamification and learners are asking for it? - no problem. You just need to develop a new module in your training platform and instantly get all the benefits to all your learners.

- **Mobile Learning**

As I mentioned before, nowadays elearning can be delivered also via mobile devices. This means that people can start learning pretty much everywhere, any time they want. Learners can take courses during their morning commute to their workplace by simply bringing their smartphones along with them!

- **Reporting**

In order to gather useful information, and data you can actually use, you have to be extremely precise while reporting by using standards and a unified approach. Thanks to modern technologies it's extremely easy to automatically create reports that fit your needs, no matter how many learners you're trying to evaluate.

- **Management**

Obviously it's important to get reports right away, but it's also very important to keep your data and reports in a place where you will be able to retrieve them at any time for future analysis and history tracking. Say no to huge paper



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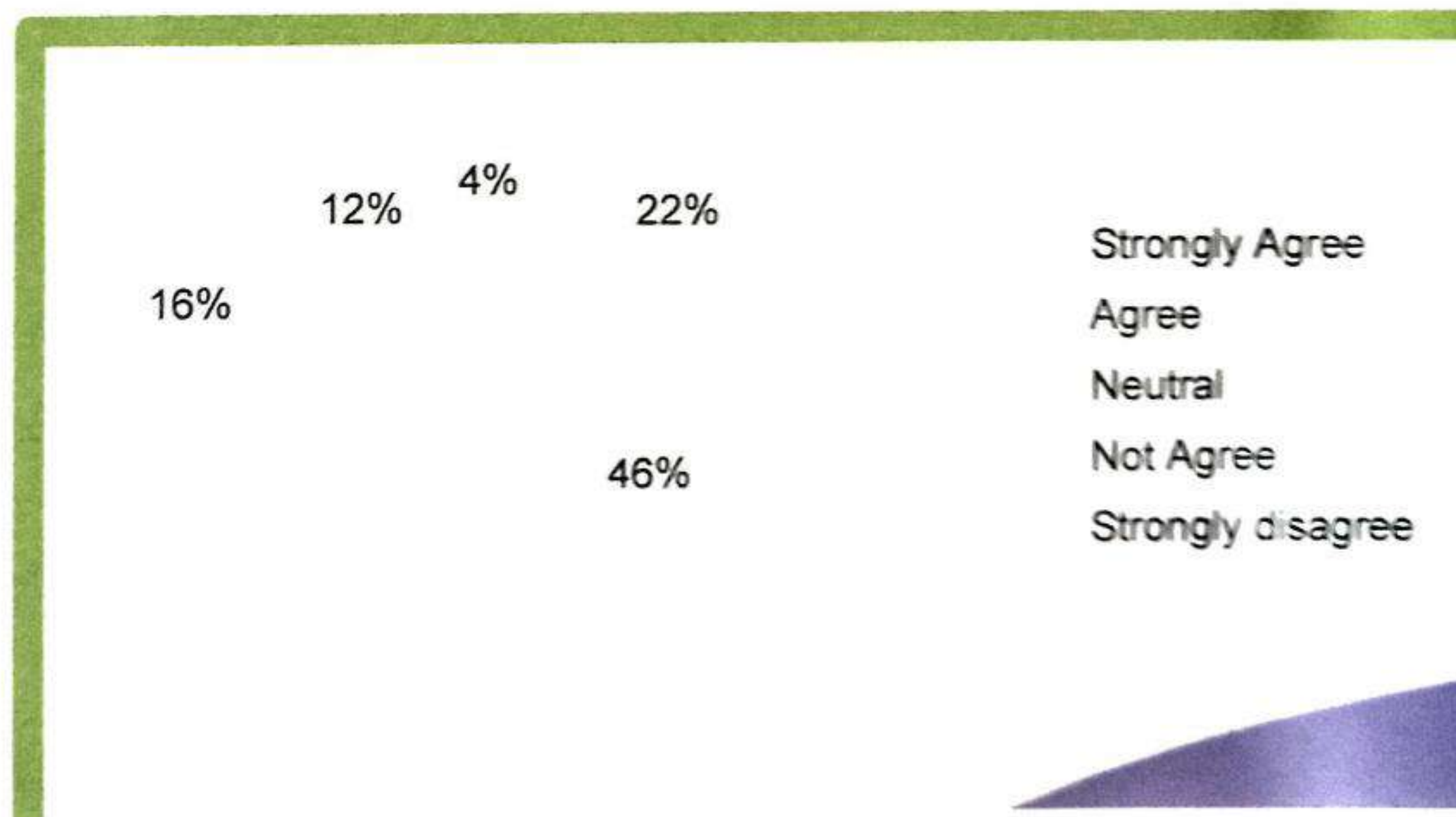
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folders that can easily get lost or ruined. It's now time to leverage databases and online storage to keep your learner's records in a permanent and easy to browse organizational system.

Table 1 : Impact of e-learning on the teaching-learning process

Strongly Agree	Agree	Neutral	Not Agree	Strongly disagree
11	23	8	6	2

Graph 1 : Impact of e-learning on the teaching-learning process



The above graph shows the impact of e-learning on the teaching-learning process. Out of 50 respondents 22% respondents are strongly agree with the statement 'Impact of e-learning on



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the teaching-learning process, 46% respondents agree with the statement, 16% neutral with the statement, 12% not agree with the statement while 4% strongly disagree with the statement.

That means majority of respondents feels that e-learning is significantly impacting on the teaching-learning process. It helps to retain facts for longer time. Hence the hypothesis 'There is a significant impact of e-learning on the teaching-learning process' is accepted.

Conclusion :

e-learning is the new tool of learning for the future, for it is today enabling new career oriented fresh brides to learn cooking on one hand and also, on the other, it is furthering the traditional role of a teacher, yet, unless all this gains acceptance from both, the society at large as well as the Government, the same cannot be brought into the mainstream in India and will lack the necessary fire-power to enable it to achieve its true potential, and we will have to be happy that a part of e-learning is still being recognized as a medium of education on the fringe of the normal education system, although, it has the potential to completely replace the original. Technology integration in education to enhance teaching and learning can take place in different forms. Teachers can integrate technology using different e-learning tools. E-learning has significant impact on the teaching-learning process.

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Role of Green Technology in Entrepreneurship Development

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Abstract:

As per United Nations survey, it is clear that, “There is a close relationship between per capita income and Industrial production which is a part of total National Income of a country.” To solve problems such as population explosion, poverty, unemployment, economic disparity, illiteracy, declining standard of living, lack of social safety in a developing country like India and to increase the speed of economic development, industrialization plays an importance role. Sustainable development is the one which does not think of self sufficiency attitude but to keep in mind for provision of future generations through sustainable development. The importance of green technology is worth while implementing so called developmental process to reduce ill effect on living beings. The use of Green technology is needed in every act of life. Otherwise, entire mankind and living creatures will have to suffer consequences of unknown health issues.

Introduction:

India is a reach country in term of natural resources. It is rich with resources such as land, sea coast, rivers, forests, mountains, different weather conditions, rainfall, land fertility etc. Human resources are also widely available in India. Conducive environment is available for resources used in agriculture, industry, energy and service sectors, rapid economic development of the country is possible through the development as these sectors.

Importance of industrial development in India

As per United Nations survey, it is clear that, “There is a close relationship between per capita income and Industrial production which is a part of total National Income of a country.” To solve problems such as population explosion, poverty, unemployment, economic disparity, illiteracy, declining standard of living, lack of social safety in a developing country like India and to increase the speed of economic development, industrialization plays an importance role. Primary sector businesses based on nature like agriculture, animal husbandry, forestry, fishery etc., secondary sectors like small and medium enterprises, mills, firms and tertiary sector businesses providing services such as transportation, banks and insurance are closely related to each other. Government is giving emphasis on the development of all the three sectors and investments for speedy economic development of the country. Agricultural development, proper use of natural resources, increase in national and per capita income, balanced economic development, increase in exports, employment generation, improvement in standard of living, progress in self sufficiency, increase in the rate of savings and investment, increase in government income through taxes, educating people, qualitative development in skills and training, social and economical balance in the country is possible through industrial development of the country.

Sectors	People involved in various sectors				
	1991	2001	2010	2015	2017
1. Primary Sector	66.8%	58.4%	51.52%	44.36%	42.74%
2.Secondary Sector	17.5%	16.2%	21.81%	23.80%	23.79%
3. Tertiary Sector	20.5%	25.4%	26.68%	31.74%	33.48%

(Source: <http://www.statista.com>)

India also started large scale production following western countries. Use of modern technology, heavy industrial equipment, large scale use of energy, uncontrolled use of raw materials and resources in production process, poisonous waste material, mishandled disposal of poisonous waste, etc. trends have been developed because of competition of quick industrial development causing increase in environmental pollution.

By this way, every factor in nature is useful for human beings. Factors such as flora and fauna, trees, plants, rivers, rocks, clay, mountains, valleys, animals, birds are fostering and important for human life. Without these, human life can not attain balance. Animals, birds and trees in nature play vital role in maintaining environmental balance. In spite of this human beings are exploiting these natural resources. Due to this act of humans Eco natural balance is being disturbed causing various natural calamities. If this continues, time will not be far away when human race will come to an end. Give and take relationship must exist to keep balance in natural cycle. Taking pure from nature and returning impurity creates imbalance in nature. Human draw fertility from soil and puts chemical fertilizer in soil, draws clean water from nature and returns impure water in the environment. Clean air transforms into poisonous one, creates deserts by cutting forests which are lungs of clean environment.

These dangerous changes related to environment are seen in the last 50-60 years which were not seen in the last thousand years which resulted in an increase in air, water and land pollution. Pollution like this have caused assault on the lives of people of different countries including India. It will not take time for this earth to stand in the queue of non living planets if this continues with today's speed. Environmental pollution can be divided into four main types.

- A) Air pollution
- B) Water pollution
- C) Noise pollution
- D) Soil pollution

Industrialization, population explosion, deforestation, urbanization, transport and fuel consumption, use of chemical fertilizers and pesticides, industrial accidents, nuclear plants and wars are responsible for all kinds of pollutions.

Air Pollution :

Earth is surrounded by different layers of gases. These gases are very important for living beings. But because of human intervention air pollution is increasing at a very high speed. Following are the main reasons for air pollution.

- i) Industrialization : Number of factories have been increased after industrialization. Factories emitted smoke, polluted gases, carbon particles, hydrogen and hydrogen elements and many poisonous gases in the environment which affected ozone layer.
- ii) Fuel Consumption : Coal and coke crude oil and natural gas burning resulted in production of different poisonous gases, smoke, ash, carbon particles, fly ash produced in thermal power plants etc. resulted in air pollution.
- iii) Automobiles : Petrol, diesel have been used all over the world for transportation that uses crude oil. The smoke that has been emitted by these vehicles contains micro lead particles. Due to incomplete combustion of these fuels, many poisonous gases mix in the air resulting in air pollution.

- iv) Radioactive liquids and nuclear explosion : Atom bomb was the new pollutant which has been produced after second world war. Explosion of atom bomb results in production of dangerous radioactive smoke which spreads in environment resulting in air pollution. Nuclear explosion tests carried out by developed countries caused air pollution. Ash spread out of nuclear plants in the environment have also resulted in air pollution.
- v) Other reasons : Urbanization polluted particles produced due to human actions, increased uses of pesticides, deforestation, increased use of cold storage and cold boxes are other reasons for increase in air pollution.

Water Pollution :

Clean water is as important as air as the basic necessity of human. Water pollution is increasing at a high rate due to various manmade reasons.

- i) Household human intervention : Soap used while bathing, detergent cakes and powder used while washing clothes and utensils, open defecation, river side prayers, immersion or idols etc. are the reasons for river pollution.
- ii) Industrial drainage : Most of industries during its production processes uses water at a large scale. contaminated water produced during processes are thrown in rivers that pollutes sea water as well.
- iii) Water pollution through agricultural sectors : Pesticides, insecticides and fertilizers etc. used in agricultural sector, the large part of which reach to the sea through drainage, rivers resulting in imbalance in water bodies that leads to pollution.
- iv) Oil leakages : Most of the oil refineries in the world are based near seashore. Water pollution caused due to water transport, loading and unloading of oil at port and accidents in oil refineries are very dangerous for water pollution.

Soil Pollution :

Soil is a natural resource. Misuse and wastage of soil can lead to major problem because the upper layer of soil contains millions of micro organisms helping plants grow through this layer. Soil gets contaminated due to various human actions.

- i) Pollution due to industrial waste : Hazardous waste are created during industrial processes and wastage and scrap produced through mining spreads over land. Pit created due to mining damaging the original structure of soil.
- ii) Agricultural waste : Unlimited use of chemical fertilizers, insecticides and pesticides in farming causes devastating results on bio chemical soil diversity cycle and quality of soil deteriorates. Due to over irrigation soil becomes saline.
- iii) Civic Garbage : This type of waste can be solid waste and drainage. Solid waste contain dissolvable and un-dissolvable substances. If these are not disposed in proper manner, they create serious problems related to health.
- iv) Radioactive factors : Mining and nuclear plants emits many radioactive substances. These are very dangerous to living organisms that destroys plants and reduces the fertility of soil.

Noise Pollution :

Like air and water pollution, noise pollution is also a serious issue. This problem is mainly created by man. Noise created out of appliances used at homes and offices, noise created out of



various processes at construction sites, noise made by vehicles during traffic, noise made in factories during processes, explosions, noise made in rallies, airoplanes, rocket, noise in metro cities etc. are the reasons for noise pollution.

To stop evils of all the pollutions mentioned above, there is need of green technology in every sector. Even though green technology is a new concept, ancient India, before industrialization used this concept in various production sectors. Green technology is a technology that does not harm environment during its use. Natural resources will be saved because of its use. All sectors need green technology knowledge now a days. Agriculture industry energy, construction and service sectors need environment friendly green technology. Conservation of environment is becoming a sought after subject in the world. Every action is taken considering nature's enhancement, proper use of natural resources, use of renewable energy resources, minimum use of resources are being used in production processes, use of pro environment friendly matters instead of poisonous chemicals, proper disposal of hazardous waste etc. is the need of the hour. Adoption of this technique will assure protection of environment as well as industrial development. It will make possible for human being to enjoy highly healthy and satisfactory life.

Clean environment means clean sky, fresh air, clean water fall, clean water river, green forests, wild life un-affected from humans, birds freely flying in the sky, domestic animals grazing food, green villages, towns and cities, maintained ozone layer, fertile land, manure to increase fertility of land, bacteria's which decomposes dead and decaying matter and release carbon back to environment, all this living and non-living factors are involved in the process.

Use of green technology in different sectors:

Today different Self Help Groups and organizations are seen to adopt different green technologies in various sectors, some important sectors are described below with case studies :

1.Agriculture Sector:

in recent years the farmers are widely using artificial chemicals. Due to excessive use of Chemical Fertilizers, poisonous pesticides and insecticides, High Yield variety seeds etc. , soil, water, air & agricultural products are highly affected, increasing environmental pollution. This is why adoption of green technology is very important in this sector.

Case Study I:

Mr. Virendra Barbate, a farmer from a small village Chacher of Taluka Mouda, Distt. Nagpur, is cultivating rice since last 15 years without use of any artificial chemical fertilizers. He uses easily available low cost natural manures to increase the land fertility and gets healthy and pure products without affecting water, land and micro-organisms. His pure and healthy product is then sold at a high price.

In the agricultural sector, nationwide progressive farmers are adopting chemical-free/poison-free farming. Due to this farming technique, spreading of environmental pollution is being controlled to some extent.

2. Rural, agricultural, small scale industry :

Cottage industries are the small scale industries and it has to run in the rural areas in small scale. It uses small machines, handy equipments, minimum chemicals, maximum man power etc. These industries mainly use local skills and equipments increasing local employment and protecting environment.



Case study no. 2:

The place is Gopuri in Wardha district. Production societies in Gopuri produces edible oils through wooden mills. It does not use chemicals for producing oils and does not use chemical processes for producing various other products. Cloth is manufactured with cotton by using small machines and it does not produce any chemical waste.

Today, every village and home need such kind of industries. It uses less energy sources and more human resources. There is possibility to produce nutritious products and goods through poison less processes creating employment at the same time. It also lessens the danger of pollution. Government runs many schemes to boost such industries. The need of the hour is to turn the youths in rural areas towards this sector.

3) Construction sector:

There is rapid increase in cement forests in this modern era. Manufacturing of cement requires high amount of chemicals and energy. To reduce this use, many institutions have turned towards constructing eco friendly houses and buildings.

Case study 3: the institute named Centre of Science for villages in Wardha district constructs eco friendly houses without using cement. By using eco friendly technology one gets natural light, reduces the requirement of electricity, construction of toilets that requires less water, construction that gives natural coolness, proper use of rain water and disposal of litter and sewage disposal. A renowned hotelier Mr. Vitthal Kamat of Mumbai, also used this type of green technology to construct lavish Orchid Hotel near Santacruz.

Many self help groups, institutes and individuals have started constructing such houses using green technology that uses less cement, using other natural resources optimally and properly. Emphasis is given to control the temperature and natural lighting system that saves fuel and energy.

4) Industrial sector:

Large and Medium scale industries should carefully use natural resources such as gases, metals, energy, and water. It is very crucial to give lessons on the importance of conservation of environment while training emerging entrepreneurs about entrepreneurship development and management. It is expected to use modern technology that conserves environment in every production process. It is necessary to set aside hazardous pollutants and treat the industrial sewage. It is obligatory to implement pollution removing technology and related law should be strictly adhered to before the starting of new production unit.

Apart from using green technology in manufacturing processes, eco friendly packaging should also be used everywhere for packing of finished products.

Consumption sector:

A common individual also can perform small pro-environment friendly activities. Optimum use of energy and other natural resources at home and at work places. Actions such as proper disposal of solid waste and sewage water, rain water harvesting, use of solar energy and use of chemical free lifestyle can lead to environment conservation.

Conclusion:

Every activity and process in service sector in Indian economy viz. trade, transportation, banking, information technology, education, health, security, telecommunication, social services



should be pro environment that saves energy and fuel and save and increase biodiversity and uses renewable energy.

Sustainable development is the one which does not think of self sufficiency attitude but to keep in mind for provision of future generations through sustainable development. The importance of green technology is worth while implementing so called developmental process to reduce ill effect on living beings. The use of Green technology is needed in every act of life. Otherwise, entire mankind and living creatures will have to suffer consequences of unknown health issues.

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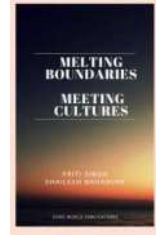


MELTING BOUNDARIES

MEETING CULTURES

PRITI SINGH
SHAILESH BAHADURE

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IMAGE OF THE TREE: www.kindpng.com

EDITORIAL

MELTING BOUNDARIES: MEETING CULTURES

Literature, language and culture form an amazing trio in which civilizations of the world thrive. Language and culture are intertwined as their fusion gives rise to the rich literature of any region. In fact, as someone rightly said, *“Language is the road map of a culture. It tells you where its people come from and where they are going”*.

The concept of a boundary represents geographical, political, sociological, psychological or linguistic boundaries. It is only through translation which is interdisciplinary in nature that enables boundaries to merge and melt. In this context translation is inextricably linked with the idea of boundaries. When boundaries melt then the doors unlock themselves for cultures to meet and translators make this meeting of cultures possible.

The role that translation plays in overcoming social and political boundaries is significantly immense. Translation brings communities together fostering communication and dialogues. Machine aided translation is also gaining importance with rapid strides. It is with this perspective of interdisciplinarity that the present collection of research topics is strung together in this volume of ‘Melting Boundaries Meeting Cultures’.

In order to have a diverse outlook and formal attention on how translation is achieved keeping intact the issues and integral facets of culture and advancement of human life, research articles and papers from Marathi and Hindi language too have been amicably accommodated.

April, 2020

- Priti Singh
- Shailesh Bahadure

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Machine Translation in Natural Language Processing

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The principal aim of the Natural Language Processing is to build a machine translation system that automatically learns translation mappings from bilingual lexemes. The Machine Translation (MT) focused on creating MT systems and technologies that cater to the multitude of translation. Data driven systems, with a statistical core engine, have proven to be the most efficient, due to the ability to adapt to broad domain coverage and being trained in new language pairs. This team works closely with research and development partners worldwide, making the system accessible to a variety of products and services.

Machine Translation has been a major focus of the NATURAL LANGUAGE PROCESSING group since 1999. This approach to Machine Translation has been “data-driven”. Rather than writing unambiguous rules to translate natural language, these algorithms on human-translated parallel texts, allows automatically learn for translation. First generation Logical Form based system learned translation patterns at the level of abstract parsed tree structures, and used to translate the entire Microsoft support knowledge base system into several languages. These recent research has focused on Statistical Machine Translation (SMT).

Syntax-Based SMT. Translating content from English language into as many foreign languages as possible is a big challenge for Multinational company’s not to mention the billions of people around the world who do not aware about English Language. The Treelet Translation System leverages an English natural language parser to help forguiding this process. This new technology is currently used in several location across Multinational company’s, including the Live translation system for computer-related texts and the Microsoft Support sytem site. Ongoing research has produced major improvements in the choice of wordinflections and word ordering in this system.

Phrase-Based SMT: Many leading STATISTICAL MACHINE TRANSLATION systems do not use any linguistic resources, such as

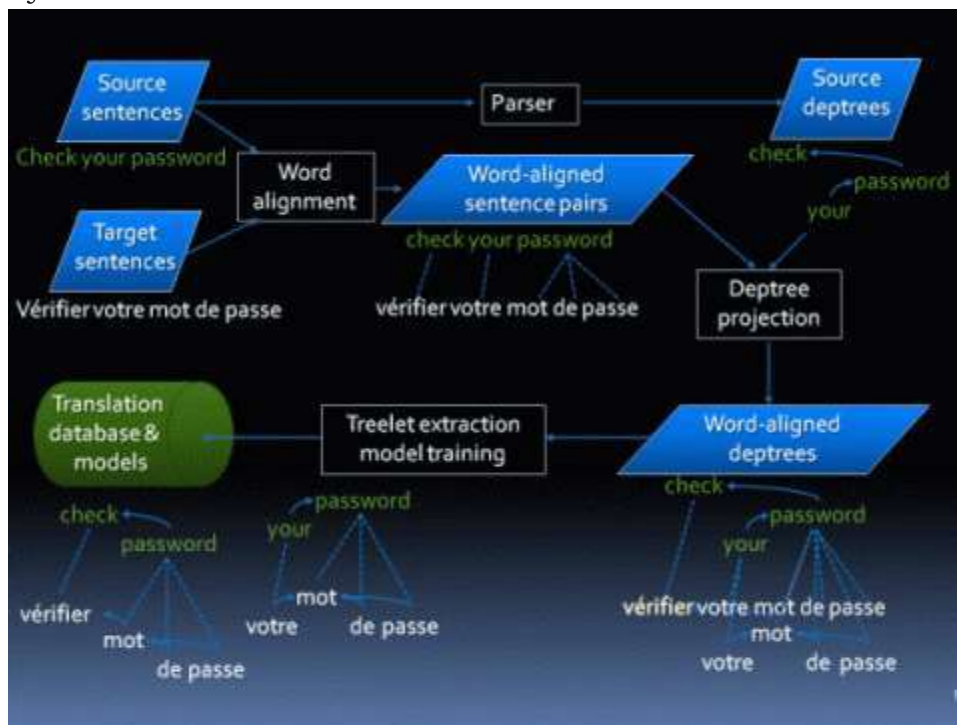
dictionaries, grammars, or parsers. These so called “phrase-based” systems on the way to learn translations of arbitrary word sequences of words directly from parallel texts. By improving the methods used to reduce the search for the best translation in this type of system, we try to find better translations in less time than previous systems.

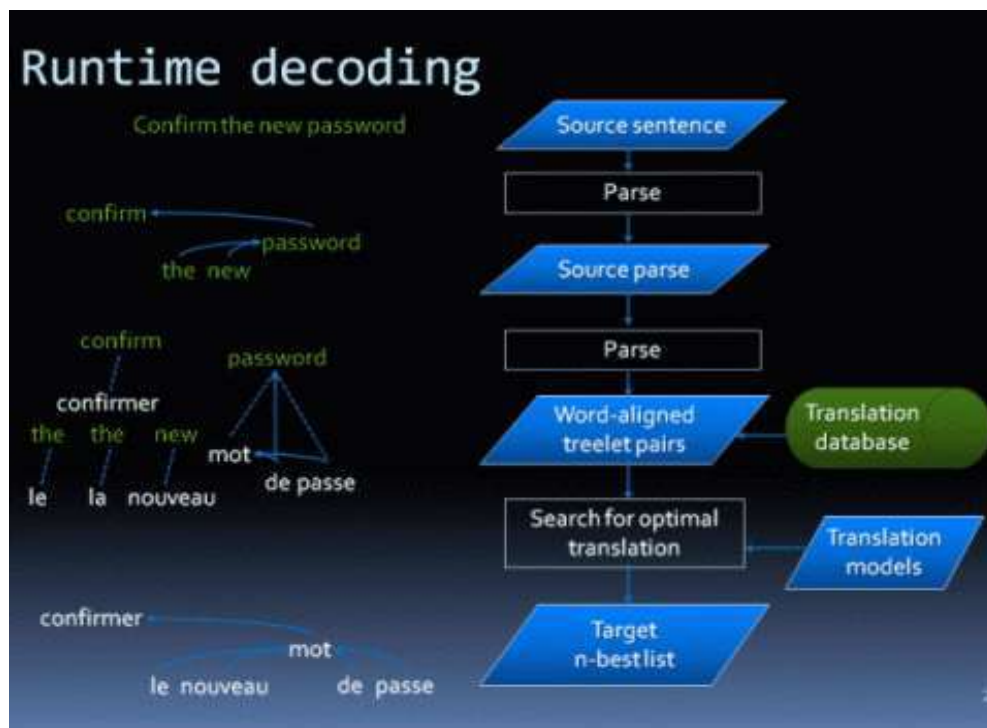
Word Alignment:- SMT systems find out translations from existing bodies of translated data. For most modern systems, identifying the word correspondences or word alignments in this translated data is a decisive step in training systems. We produced revolutionary work in both discriminative and generative approaches to word alignment, resulting in faster alignment algorithms with state-of-the-art quality.

Language Modeling:-

Large n-gram language models are a crucial component in high-quality SMT systems. Trained on only target language data, they help translation systems select fluent and readable output. MSRLM is a publicly-available language modeling toolkit developed at MSR. The toolkit is both fast and scalable, training a 5-gram model from more than one billion pre-tokenized words in about 3 hours on a single machine.

MSR MT System





Other research areas:

Some languages have their own special challenges; for instance, word boundaries are not indicated in normal Chinese texts. MSRSeg can both segment Chinese words and identify names of entities such as people and organizations, capabilities that are very useful in machine translation. More detail on our Japanese MT work can be found [here](#).

Currently our systems are trained on parallel texts that supply sentence-for-sentence translations of the original information. We have developed accurate methods of finding parallel sentences among mostly parallel documents. We have also begun research in extracting parallel data from pairs of “comparable” documents, which contain some information in common, but are not direct translations of each other.

Products and Integration Scenarios:

Microsoft Translator, a free translation portal, and a web service that powers many other translation scenarios, is the latest result of the work done by our research and product teams. The goal is to create the simplest, most intuitively integrated and useful translation services available to end users—while making ongoing improvements to translation quality. This service allows Live Search users to translate foreign language search results by clicking

on “Translate this Page”. Users can also translate words, search queries, paragraphs or entire web pages through the Microsoft Translator portal. The Bilingual Viewer interface features a unique, side-by-side web page viewer that translates entire Web pages with blinding speed between 25 sets of language pairs. In addition, there is a Windows Live Toolbar Button , an add-in that puts a button on users’ websites, allowing their visitors to translate their web page using our service, and a Windows Live Messenger Translator Bot prototype that lets users translate IM conversations in a number of popular languages. Portions of the technology behind MSR-MT, including parsing, LFs, MindNet, have been used in the grammar checkers in Word, in the natural language query function of Encarta, and in other MS products.

The system already has proven its value within Microsoft, having been used in 2003 to translate nearly 140,000 customer- support Knowledge Base articles into Spanish (If you go to the web site, click on International Support and choose Spain as your country. You can then enter Spanish queries for the KB and receive back machine-translated hits.) The effort was extended to Japanese the next year and to French and German in 2005. Now, Microsoft’s Knowledge Base materials have been translated into nine languages by MSR-MT. This approach lowered the cost barrier to obtaining customized, higher-quality MT and Microsoft's support group is now able to provide usable translations for its entire online KB. It can also keep current with updates and additions on a weekly basis - something that was previously unthinkable both in terms of time and expense.

You can also visit the [MSR Machine Translation blog](#) to keep track of our ongoing product and scenario related work. This Research work is mostly used in comparative study of different Statistical techniques used in Machine Translation.

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The System of Evaluation of Machine Translation

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Machine Translation (MT) is a sub-field of Artificial Intelligence (AI), which translates the text from one language known as source language into the text of another language known as target language. Machine translation is an instrument for removing the language barriers. In a multilingual country like India, there's a great need for translating documents from one language to another. MT is a multidisciplinary field of research. It uses the ideas from linguistics, computer science, artificial intelligence, statistics, mathematics, philosophy and many other fields. Machine Translation is one of the hottest cakes today. To a great extent, MT is playing a very vital role in the regular life of the people. Machine translation quality varies more than the quality of a human translation.

What we find today is a wide range of translations. At the root, there is the translator who translates, and here, what he feels is the most appropriate one. Needs of different users may demand different translations. All these issues make the task of translation difficult and machine translation more difficult. Likewise, the translated work is also not so easy to judge. Varied methods are developed for the same purpose. This paper tries to take a brief survey of these methods and overall system of evaluation of MT.

The evaluation of machine translation (MT) systems is a vital field of research, both for determining the effectiveness of existing MT systems and for optimizing the performance of MT systems. Progress in the field of machine translation relies on assessing the quality of a new system through systematic evaluation, such that the new system can be shown to perform better than pre-existing systems. The difficulty arises in the definition of a better system. When assessing the quality of a translation, there is no single correct answer; rather, there may be any number of possible correct translations. In addition, when two translations are only partially correct - but in different ways - it is difficult to distinguish quality. Moreover, quality assessments may be dependent on the intended use for the translation, e.g., the tone of a translation may be crucial in some applications, but irrelevant in other applications.

While there is general agreement about the basic features of machine translation (MT) evaluation, there are no universally accepted and reliable methods and measures, and evaluation methodology has been the subject of

Application of Fuzzy Logic for Decision Making in Remote Sensing Problem

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Abstract— Making decisions is undoubtedly one of the most fundamental activities of human being. We all come across with variety of alternate actions in our daily life which are available to us and at least in some instances; we have to decide which of the available actions to take. Decision making is the study of choosing alternatives options and identifying based on the preferences & best values of the decision maker. It is also a process sufficiently reducing uncertainty and doubt about alternatives to allow reasonable choice to be made from among them. It is most important scientific, social and economic endeavor. The remote sensing problem plays an important role in the data acquisition system. In this research, we studied an Application of Fuzzy Logic for Decision making in Remote Sensing Problem. Here, we have used a Multiobjective Decision making Method for solving a Remote sensing problem. From this method, we have calculated the expected utility, prior probabilities, conditional and unconditional probabilities of perfect and imperfect information and value of information is calculated.

The problem of Decision making in Remote Sensing for Fuzzy logic technique is solved using the MATLAB programming software.

Keywords— Remote Sensing, decision making, Fuzzy Logic, Multiobjective.

I. INTRODUCTION

1.1 FUZZY LOGIC

The real life is very difficult and complex, as the complexity of the life is increases, our potential to make precise and accurate statements about its behavior is reached beyond which precision and significance become almost exclusively characteristics. These are the super words of the Prof. Lotfi Zadeh who had introduced the fuzzy logic in 1965.

When there is more uncertainty and inaccurate data, the fuzzy logic method is very useful for solving problems. When the cost of information increases then the cost of fuzzy information is far less than the perfect or imperfect information. Thus, there are two most important advantages of the fuzzy logic technique: Understanding of difficult problems becomes easier and makes the system is very costs effective.

The fuzzy logic is most popular in consumer products such as Refrigerator, washing machine, elevators, air conditioners, cameras, rice cookers, automobile etc.

1.2 DECISION MAKING

Decision making is the selection and identifying the alternatives based on the preferences and important of values of the decision maker. It is also a process sufficiently reducing uncertainty and doubt about alternatives to allow reasonable choice to be made from among them. It is most important scientific, social and economic endeavor. To be make able to make consistent and correct choices is the essence of any decision process imbued with uncertainty.

In the decision making, there are number of alternative choices to be considered, and in case we have to choose the one that best fits with our desires, lifestyle, goals values and so on.

For Example:- A manager makes a good decision, but the outcome is bad and the manager gets fired. "A doctor uses the best established procedures in a medical operation and the patient dies; then the doctor gets sued for malpractice". In all these situation the outcomes have nothing to do

with the quality of the decisions or with the process itself. We have about the possible outcomes, about the value of new information, about the way of the conditions change with time (dynamic), about the utility of each outcome action pair, each action is typically vague, ambiguous and otherwise fuzzy.

1.3 BAYESIAN DECISION MAKING

In Many times, the decision makers have a general ability to find more information than required to make a best decision. When we want to decide a best decision among various options & alternatives, our choice is predicted on information about the future life, which is normally discretized into several "states of nature". If we knew with certainty the future states of nature, we would not need an analytic method to assess the likelihood of a given outcome. The future states of nature can be characterized as best probability events stated by Bayesian decision method. These are the words of "Thomas Bayes" an English clergyman and mathematician who set out his theory of probability in 1764. The Bayes theorem is quantifying uncertainty based on probability theory. This theorem defines a rule for refining an hypothesis by factoring in additional evidence and background information and this leads to a probability that the hypothesis is true. The decision analysis can indicate not only the best alternative to pursue, given the current problem description, but also weather a problem is ripe for deciding and, if not, how to proceed to reach that stage.

1.4 FUZZY DECISION MAKING

When the knowledge of the probabilities of the outcome states is unknown and the decision must be made under conditions of uncertainty then the fuzzy decision theory is used to accommodate this vagueness or ambiguity. The theories of classical decision making are:

- 1) Statistical decision theory (based on bayes' rule)
- 2) Mathematical (linear or non-linear) programming
- 3) Multi-criteria decision making

In Fuzzy decision making, the non-specificity inherent in human formulation of preference, vagueness are the common issues. The membership functions of fuzzy goals serve much the same purpose as utility or objective functions in classical decision making that order the outcomes according to prefer ability. When probabilities of the outcomes are not known, or may not even be relevant, and outcomes for each action are characterized only approximately we say that decisions are made under uncertainty. Fuzzy information is far less costly for precise information cost is far more as the precision increases cost becomes prohibit. But, if we have fuzzy information then fuzzy information takes less cost & still the conclusion drawn by using fuzzy logic will be less costly.

II. METHODOLOGY

Many simple decision processes are based on a single objective, such as minimizing cost maximizing profit, minimizing run time, and so forth. The two primary issues in multiobjective decision making are to acquire meaningful information regarding the satisfaction of the objectives by the various choices i.e. alternatives and to rank or weight the relative importance of each of the objectives. The typical multiobjective decision problem involves the selection of one alternative, a_i , from a universe of alternatives A given a collection, or set, say $\{O\}$, of criteria or objectives that are important to the decision maker. We want to evaluate how well each alternative, or choice, satisfies each objective, and we wish to combine the weighted objectives into an overall decision function in some plausible way. This process naturally requires subjective information from the decision authority concerning the importance of each objective. Ordinal ordering of this importance are usually the easiest to obtain. Numerical values, ratios, and intervals expressing the importance of each objective are difficult to extract and, if attempted and then subsequently altered, can often lead to results inconsistent with the intuition of the decision maker.

To develop this calculus we require some definitions. Define a universe of n alternatives, $A = \{a_1, a_2, \dots, a_n\}$, and a set of r objectives, $O = \{O_1, O_2, \dots, O_r\}$. Let O_i indicate the i th objective. Then the degree of membership of alternative a in O_i , denoted $\mu_{O_i}(a)$, is the degree to which alternative a satisfies the criteria specified for this objective. We seek a decision function that simultaneously satisfies all of the decision objectives; hence, the decision function, D, is given by the intersection of all the objective sets,

$$D = O_1 \cap O_2 \cap \dots \cap O_r \dots \dots \dots (1)$$

Therefore, the grade of membership that the decision function, D, has for each alternative a is given by

$$\mu_D(a) = \min [\mu_{O_1}(a), \mu_{O_2}(a), \dots, \mu_{O_r}(a)] \dots \dots \dots (2)$$

The decision, a^* , will then be the satisfies

$$\mu_D(a^*) = \max_{a \in A} (\mu_D(a))$$

We define a set of preferences, {P}, which is constrained to be a linear and ordinal. The Elements of this Preference set can be linguistic values such as none, low, medium, high, absolute, or perfect; or they could be

values on the interval [0,1]. These preferences will be attached to each of the objectives to quantify the decision

maker's feelings about the influence that each objective should have on the chosen alternative.

The decision function, D, now takes on a more general form when each objective is associated with a weight expressing its importance to the decision maker. This function is represented as the intersection of r-tuples, denoted as a decision measure, $M(O_i, b_i)$, involving objectives and preferences.

$$D = M(O_1, b_1) \cap M(O_2, b_2) \cap \dots \cap M(O_r, b_r) \dots \dots \dots (3)$$

III. EXPERIMENTAL WORK

Here we describe a remote sensing problem which plays an important role in the data acquisition. In this example we use the multi-objective decision method to find the required output. And this problem is solved using MATLAB software.

For environmental modeling, remote sensing data play an important role in the data acquisition. Researchers must decide which type of sensor data best meet their preferences. Among the many alternatives sensors available, the list of candidates has been reduced to three: LANSAT7 (LS7), GOES (GS), and TERRA (TA). The researchers have defined four objectives that impact their decision:

- 1) cost of the data (COST)
- 2) time to deliver data (TIME)
- 3) Resolution of data collected (RES), and
- 4) Time for the sensor to return to the same spot cycle (CT)

In above objectives, there was some disagreement as to how to define the importance of each objective in the preference set so the researchers decided to define two sets of preferences, P1 and P2.

- Alternatives: $A = \{LS7, GS, TA\}$
- Objectives: $O = \{COST, TIME, RES, CT\}$
- Preferences: $P_1 = \{b_1, b_2, b_3, b_4\} = \{0.8, 0.4, 0.8, 0.7\}$
- $P_2 = \{b_1, b_2, b_3, b_4\} = \{0.4, 0.6, 0.4, 0.5\}$

The degree of membership of each alternative in the objectives is as follows;

- $O_1 = \{0.2/LS7, 0.8/GS, 0.4/TA\}$
- $O_2 = \{0.6/LS7, 1/GS, 0.2/TA\}$
- $O_3 = \{1/LS7, 0.4/GS, 0.8/TA\}$
- $O_4 = \{0.8/LS7, 0.7/GS, 0.2/TA\}$

PROGRAMMING IN MATLAB

PROGRAM 1: FOR THE FIRST PREFERENCE P1

```
% alternatives: A={LS7,GS,TA}
% objectives : O= {COST, TIME, RES, CT}
% preferences : P1={b1, b2, b3, b4} =
```

```

% O1={0.2/LS7, 1/GS, 0.4/TA}      objective 1
% O2={0.6/LS7,1/GS,0.2/TA}      objective 2
% O3={1/LS7,0.4/GS,0.8/TA}      objective 3
% O4={0.8/LS7,0.4/GS,0.2/TA}    objective 4
P1=[0.8 0.4 0.8 0.7] % P1={b1,b2,b3,b4}
P2=[0.4 0.6 0.4 0.5] % P2={b1,b2,b3,b4}

```

```

O1=[0.2 0.8 0.4] % objective 1
O2=[0.6 1 0.2] % objective 2
O3=[1 0.4 0.8] % objective 3
O4=[0.8 0.7 0.2] % objective 4
LS7=[0.2 0.6 1 0.8] % (LS7)
GS =[0.8 1 0.4 0.7] % (GS)
TA=[0.4 0.2 0.8 0.2] % (TA)
P11 = 1-P1 % complement of P1 [P11]
Da1=zeros(1,4) % D(a1)=D(LS7)=Da1

```

```

for k=1:4
    if P11(1,k)>LS7(1,k)
        Da1(1,k)=P11(1,k)
    else
        Da1(1,k)=LS7(1,k)
    end
end
Da1=min(Da1) % minimum of Da1 over alternative a1
Da2=zeros(1,4) % D(a2)=D(GS)=Da2
for k=1:4
    if P11(1,k)>GS(1,k)
        Da2(1,k)=P11(1,k)
    else
        Da2(1,k)=GS(1,k)
    end
end
Da2=min(Da2) % minimum of Da2 over alternative a2
Da3=zeros(1,4) % D(a3)=D(TA)=Da3
for k=1:4
    if P11(1,k)>TA(1,k)
        Da3(1,k)=P11(1,k)
    else
        Da3(1,k)=TA(1,k)
    end
end
Da3=min(Da3) % minimum of the Da3 over alternative a3
Da1=0.2 % alternative a1
Da2=0.4 % alternative a2
Da3=0.3 % alternative a3
D1=[Da1 Da2 Da3]
D1=max(D1) % maximum of all alternatives

```

PROGRAM 2: FOR THE SECOND PREFERENCE (P2)

```

% alternatives: A= {LS7, GS, TA}
% objectives: O={COST, TIME, RES, CT}

```

```

% preferences: P1={b1, b2, b3, b4}

% O1={0.2/LS7, 1/GS, 0.4/TA}    objective 1
% O2={0.6/LS7, 1/GS, 0.2/TA}    objective 2
% O3={1/LS7, 0.4/GS, 0.8/TA}    objective 3
% O4={0.8/LS7, 0.4/GS, 0.2/TA}  objective 4

```

```

P1= [0.8 0.4 0.8 0.7]    % P1={b1, b2, b3, b4}
P2= [0.4 0.6 0.4 0.5]    % P2={b1,b2,b3,b4}

```

```

O1= [0.2 0.8 0.4]        % objective 1
O2= [0.6 1 0.2]          % objective 2
O3= [1 0.4 0.8]          % objective 3
O4= [0.8 0.7 0.2]        % objective 4

```

```

LS7= [0.2 0.6 1 0.8]    %(LS7)
GS = [0.8 1 0.4 0.7]    %(GS)
TA= [0.4 0.2 0.8 0.2]   %(TA)

```

```

P22=1-P2    % COMPLEMENT OF P2
DA1= zeros(1,4) % D(A1)=D(LS7)=DA1

```

```

for k=1:4
    if P22(1,k)>LS7(1,k)
        DA1(1,k)=P22(1,k)
    else
        DA1(1,k)=LS7(1,k)
    end
end
DA1=min(DA1) % minimum of DA1 over alternative A1

```

```

DA2=zeros(1,4) % D(A2)=D(GS)=DA2
for k=1:4
    if P22(1,k)>GS(1,k)
        DA2(1,k)=P22(1,k)
    else
        DA2(1,k)=GS(1,k)
    end
end
DA2=min(DA2) % minimum of DA2 over alternative A2

```

```

DA3=zeros(1,4) % D(A3)=D(TA)=DA3
for k=1:4
    if P22(1,k)>TA(1,k)
        DA3(1,k)=P22(1,k)
    else
        DA3(1,k)=TA(1,k)
    end
end
DA3=min(DA3) % minimum of DA3 over alternative A3

```

```

DA1=0.6    % D(a1)=D(LS7)=DA1
DA2=0.6    %D(a2)=D(GS)=DA2

```

```

DA3=0.4      % D(a3)=D(TA)=DA3
D2=[DA1 DA2 DA3] % it will be written down in row wise matrix
D2=max(D2)   % D2=maximum of D2

```

PROGRAM 3:

```

DA1=0.6      % D(a1)=D(LS7)=DA1
DA2=0.6      % D(a2)=D(GS)=DA2
DA3=0.4      % D(a3)=D(TA)=DA3
D2=[DA1 DA2 DA3] % in row wise matrix
D2=max(D2)   % D2=maximum of D2
% But there is a tie between alternative A1 A2
p2=[0.4 0.6 0.4 0.5]
O1=[0.2 0.8 0.4] % O1={0.2/LS7,0.8/GS,0.4/TA}
O2=[0.6 1 0.2]   % O2={0.6/LS7,1/GS,0.2/TA}
O3=[1 0.4 0.8]   % O3={1/LS7,0.4/GS,0.8/TA}
O4=[0.8 0.7 0.2] % O4={0.8/LS7,0.7/GS,0.2/TA}
      LS7=[0.2 0.6 1 0.8] % (LS7)
      GS =[0.8 1 0.4 0.7] % (GS)
      TA=[0.4 0.2 0.8 0.2] % (TA)
P22=1-P2      % complement of P2
% To remove the terms from the alternatives A1 and A2 of 0.6
DA11=zeros(1,1) % D^(a1)= DA11= D^(LS7)
      if P22(1,4)>LS7(1,4)
          DA11(1,1)=P22(1,4)
      else
          DA11(1,1)=LS7(1,4)
      end
DA11=min(DA11) % minimum of DA11
DA22=zeros(1,2) % D^(a2)=DA22=D^(LS7)
      if P22(1,2)>GS(1,2)
          DA22(1,1)=P22(1,2)
      else
          DA22(1,1)=GS(1,2)
      end
      if P22(1,4)>GS(1,4)
          DA22(1,2)=P22(1,4)
      else
          DA22(1,2)=GS(1,4)
      end
DA22=min(DA22)
D3=[DA11 DA22]
D3=max(D3)

```

IV. RESULT AND DISCUSSION

In this example of the Remote Sensing problem, we studied about the role of a decision in a data acquisition System.

OUTPUT: 1

```

P1 = 0.8000  0.4000  0.8000  0.7000
P2 =0.4000  0.6000  0.4000  0.5000
O1 = 0.2000  0.8000  0.4000
O2 = 0.6000  1.0000  0.2000

```

O3 = 1.0000 0.4000 0.8000
 O4 = 0.8000 0.7000 0.2000
 LS7 = 0.2000 0.6000 1.0000 0.8000
 GS = 0.8000 1.0000 0.4000 0.7000
 TA = 0.4000 0.2000 0.8000 0.2000
 P11 = 0.2000 0.6000 0.2000 0.3000
 Da1 = 0.2000 0.6000 1.0000 0.8000
Da1 = 0.2000
 Da2 = 0.8000 1.0000 0.4000 0.7000
Da2 = 0.4000
 Da3 = 0.4000 0.6000 0.8000 0.3000
Da3 = 0.3000
 D1 = 0.2000 0.4000 0.3000
D1 = 0.4000

OUTPUT : 2

P1 = 0.8000 0.4000 0.8000 0.7000
 P2 = 0.4000 0.6000 0.4000 0.5000
 O1 = 0.2000 0.8000 0.4000
 O2 = 0.6000 1.0000 0.2000
 O3 = 1.0000 0.4000 0.8000
 O4 = 0.8000 0.7000 0.2000
 LS7 = 0.2000 0.6000 1.0000 0.8000
 GS = 0.8000 1.0000 0.4000 0.7000
 TA = 0.4000 0.2000 0.8000 0.2000
 P22 = 0.6000 0.4000 0.6000 0.5000
 DA1 = 0.6000 0.6000 1.0000 0.8000
DA1 = 0.6000 % minimum of DA1
 DA2 = 0.8000 1.0000 0.6000 0.7000
DA2 = 0.6000 % minimum of DA2
 DA3 = 0.6000 0.4000 0.8000 0.5000
DA3 = 0.4000 % minimum of DA3
 D2 = 0.6000 0.6000 0.4000
D2 = 0.6000

OUTPUT 3:

DA1 = 0.6000
 DA2 = 0.6000
 DA3 = 0.4000
 D2 = 0.6000 0.6000 0.4000
 D2 = 0.6000
 p2 = 0.4000 0.6000 0.4000 0.5000
 O1 = 0.2000 0.8000 0.4000
 O2 = 0.6000 1.0000 0.2000
 O3 = 1.0000 0.4000 0.8000
 O4 = 0.8000 0.7000 0.2000
 LS7 = 0.2000 0.6000 1.0000 0.8000
 GS = 0.8000 1.0000 0.4000 0.7000
 TA = 0.4000 0.2000 0.8000 0.2000
 P22 = 0.6000 0.4000 0.6000 0.5000
 DA11 = 0

$DA_{11} = 0.8000$
 $DA_{11} = 0.8000$
 $DA_{22} = 0 \quad 0$
 $DA_{22} = 1 \quad 0$
 $DA_{22} = 1.0000 \quad 0.7000$
 $DA_{22} = 0.7000$
 $D_3 = 0.8000 \quad 0.7000$
 $D_3 = 0.8000$

In the example of remote sensing, the many alternative sensors were available such as LANSAT 7, GOES (GS) and TERRA (TA). These were all alternatives which were collected in A. The objectives were COST, TIME, and RESCT. We assume that, preferences P1 and P2. P11 is complement of P1 and P22 is complement of P2. The Intersection and Union has been taken of preferences P11 and objectives O1, O2, O3, and O4. The result was stored in Da1, Da2, and Da3 and taken the maximum value among all alternatives which contain the Da2 is the maximum value. Same procedure will be happened in case of preference P2 and maximum value was taken out and maximum value was DA1 and DA2. But this problem shows the same value. Therefore, there was a tie between them. To remove this tie, we were reduce the term which contain the result in DA11 and DA22 and the maximum of that value given the result of actual value that shows the final result.

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A Review on Healthcare Monitoring System Using Sensors

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Abstract- This paper deals with the review on healthcare Monitoring System using Sensors. Currently a health problem of human being is the highest problem and several solution in different way are available, however monitoring health problem using sensors gives us real time precautions parameter and studying those parameter, a solution can be find out in so time. The healthcare wireless sensor networks (HWSNs) offers support to access these sensors to allow for continuous patient monitoring. HWSNs are special field which allows continuous access to patient's sensors by which the system can detect and give alert to the medical state immediately. It helps to improve patient health monitoring as well as continuous manner. In this paper, the health care monitoring is simplified by using software i.e MATLAB to diagnosis the disease of patients and giving precautions to patient instantly without any effort and treat to patient particular when patients are in critical conditions.

Keywords - Sensors, Healthcare, HWSNs, MATLAB.

I.INTRODUCTION

1.1 HEALTHCARE WIRELESS SENSOR NETWORK (HWSNS)

It is specific field of sensor network applied to healthcare solution. It is the field now top with electronics devices, computers and internet. The system collects data and senses it wirelessly over the world so times. It can be applied to several field including forests, traffic monitoring and environmental monitoring etc., but in the field of medical science it is very useful since it is attached with human life. In hospital most of the staff perform task of monitoring in periodic intervals as per their convenience, and get the parameters information on that time only, however with application of HWSNs, they can get information continuously let ever visiting to patient and give attention in tight careful situation with the help of sensors attached to patients. These sensors are put on HWSNs to see the collected data in remote locations through internet [1].

The use of sensor nodes is challenging because when patients are hospitalized then they should keep their mobility as much as in order to promote their quality of lab. This is the challenging task and HWSNs should does mobility support of sensor nodes allowed by patients. The network coverage is one of the problems with mobility of sensor nodes. For this purpose HWSNs should enlarge multiple access ports and support rout variation in order to reach each sensor nodes [2]. In addition for getting continuous access to sensor nodes, a valid route to each one at all times must be available. Another port is handover, which mechanism to support the power of attachment change to the network. The accuracy of handover mechanism can allow for continuous connection to the sensor nodes in HWSNs. Special focus is dedicated to most recent handover mechanism that support sensor nodes intra mobility. This does need close control and data acquisition is purse on time [3].

The principles of HWSNs are;

- Real time monitoring.
- Random and continuous motion of sensor nodes.
- Desirable long life of batteries.

1.2 WIRELESS BODY AREA NETWORK

Wireless Body area network is a type of biomedical sensor networks. The Biomedical sensor nodes in WBAN are placed on, near or within a human body. In a medical healthcare system, WBAN continuously provides monitoring healthcare of especially elderly or ill people wherever needed. The Biomedical nodes sense and process vital signs such as heart rate, blood pressure, body temperature, respiratory from the human body. Then, they send collected data to a medical center via a base station in order to monitor human health by medical professionals. In the medical center, doctors/caregivers need monitoring systems/interfaces to process, analyze and visualize the received data from WBAN based systems [4].

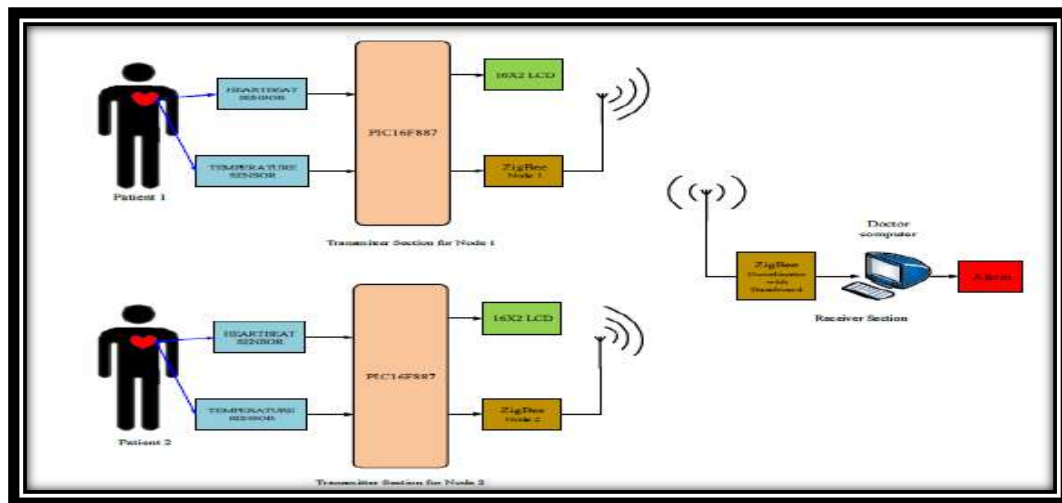


Fig 1. Block diagram of Functional System

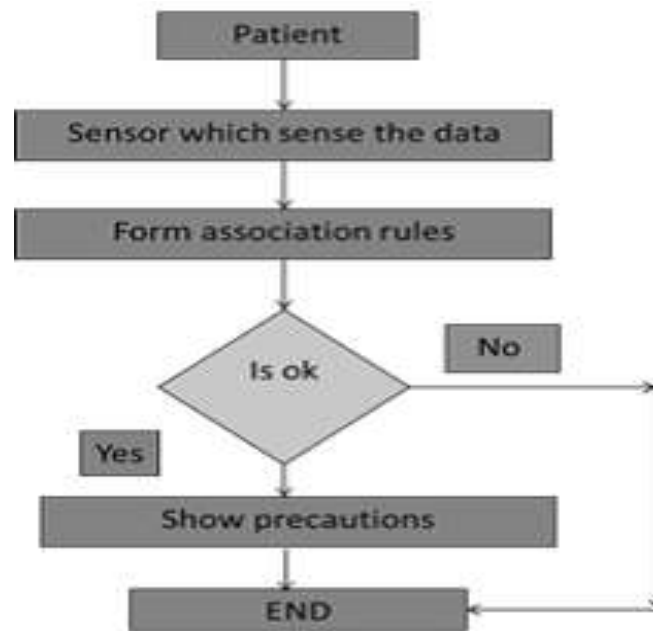
These systems use wireless technologies to transmit vital signs for medical evaluation. It is mainly used for transferring the various monitoring information about the various patients in hospitals. Wireless sensor networks have many technologies. Such as the Infrared, Bluetooth and ZigBee, Touchscreen etc. Because the angle limit problem of the infrared transmission, and the infrared have not been used for physiological signal transmission. Although Bluetooth is better than ZigBee for transmission rate, but the ZigBee technology has lower power consumption. Hence, ZigBee is generally used for 24 hours monitoring of communication transmission systems. As compared to Bluetooth, ZigBee provides higher network flexibility and a larger number of nodes connectivity, and a better transmission range with low power consumption. Large number of nodes enables the expansion of such systems. Recently, ZigBee-based wireless networks were tested in various applications [5].

II. OBJECTIVE OF RESEARCH WORK

The purpose of this work is to simulate the intra mobility solution with special attention on HWSNs. In hospital patients have to wait long time to meet the doctor and in critical condition the patients can not wait and faces several problems. The main objective of this study is to provide the things to patient via software to diagnosis the disease and giving the precaution to patients instantly without any effort or any other means. The patient has to communicate the precaution of disease and get solution [6].

III. SYSTEM CONFIGURATION

The simulation model, MATLAB used for this purpose which provides high performance computation and visualization. The most important feature is its providing capability which is very easy to leave and to use. The user can send its symptoms like temperature, blood pressure, ECG; heart bits etc via sensor and get the predictions by giving the symptoms of the users [7].

Flowchart for procedure:**Fig 2. Flowchart of System****System overview**

Thesesystems have four main parts,

- Sensing module
- Processing module
- Communication module.
- Power supply.

1. Sensing Module:It provides ability to collect certain parameters.
2. Processing Module:It includes the microcontroller which detects the capacity of Sensor node to run Program and process data [8].
3. Communication Module: It sends the data wirelessly to a network typically compliant with IEEE802.15.4 standarerd.
4. Power Supply:It is an importantpart, work as energy source for keeping node alive [9].

IV. CONCLUSION

In this paper, we present a wireless health monitoring system which is able to receive data on receiver side and immediate action will be taken according to the results obtained. This system provides effective solution to upgrade the existing health system by using different kind of sensors mounted on a single system .With the use of HWSNs a detailed comprehensive analysis of patient's disease can be done by saving lot of time. It will provide textual information to the patient so that patient can read it anywhere and act accordingly. The system is convenient and efficient in nature and thus increases interaction between patient and doctor and ultimately avoids unexpected tragedy. The use of this technique for patient monitoring can be key aspect for healthcare precaution. The healthcare provides should be improved with this technology [10].

V. APPLICATION OF WSN IN HEALTHCARE

Healthcare is always a big concern, since it involves the quality of life a given individual can have. It is always better to prevent an illness than to treat it, so individual monitoring is required as a periodic activity. The aging population of developed countries present a growing slice of government's budget, and presents new challenges to healthcare systems, namely with elderly people living on independent senior housing. Traditionally, health monitoring is performed on a periodic check basis, where the patient must remember its symptoms; the doctor performs some check and formulates a diagnostic, then monitors patient progress along the treatment, if possible[11]. However, some symptoms only manifest themselves in daily activities, where an individual may feel some pain or discomfort. Healthcare applications of wireless sensor networks allow in-home assistance, smart nursing homes, clinical trial and research augmentation [12]. In-home healthcare becomes mandatory for diseases like Parkinson or Alzheimer, providing memory enhancement through medicine reminders, mental stimulation through sounds or images of object's location control over home appliances, medical data lookup, and emergency situations. Such approach may lead to a multi-tiered architecture, with lightweight mobile computers and smart sensors in conjunction with more powerful computational devices [13].

Healthcare Application

1. Glucose level monitoring
2. Asthma.
3. Preventing medical accidents.
4. Cardiovascular diseases
5. Alzheimer, depression, and elderly people monitoring.
6. Stroke and post-stroke.
7. Artificial retina.
8. Home monitoring
9. Heart rate monitoring
10. Artificial retina.
11. Mobihealth
12. Multi-electrophysiological system[14].

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AJANTA

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18. Digital Dissimilarity: Looking Gender-Wise into the Mirror

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The primitive century led itself to an agrarian order and then to industrial revolution. This revolution in industrial sector targeted commerce throughout the world supported by technology. The present century found itself very soon on the strong hold of wired communication, then to wireless and now to virtual. There have been various areas of human existence and habitat which are monitored and controlled by technology.

The digital age we are now in is perhaps the best gift of researchers and scientists who put together their best efforts to create a seamless and hassle free world. And likewise every coin has its two sides, the digital revolution too has its benefits and losses too. Comparatively, but the ease is more in much and larger of all the cases we deal on routine basis and difficulties in very less areas.

This paper focuses on yet another aspect and that is the digital gap often found either among states, nations and races. Within nation there are various initiatives taken right from awareness creation to the realization of a particular policy or mechanism to drive simplicity in civic operations. In India only there are more than 451 million monthly active internet users and that is huge number. Comparing this (2019) we are only stand second only to China in terms of internet users and this has been positively reported by Internet and Mobile Association of India (IAMAI). Not only this but there are further things for sure to happen and that is there is a wider scope for the growth of this number. If we check out the details, it is found that there 385 million users are over 12 years of age and 66 million are in between 5 to 11 years. The active use is on multiple number of devices by the users like desktops, mobile phones, laptops and other gadgets. In case of urban users, the number is 192 millions and surprisingly the number is equal to the users in rural India. The IMAI report also has thrown opened a detailed scope to know that there is a clear gender disparity among the users reported. Taken into consideration the total

users of internet, less number of women users has been reported as compared to the male users and that questions the neutrality of a free and fair use of technology.

Earlier there have been cases of disparity based on gender in case of earnings. Though it still continues but with a difference of amount earned as salary and wages and the actual employment per gender. In case of use of technology that doesn't recognize gender at all, it is surprising to know that there are gaps even in the 21st century. It is noticed that, the female internet users' population is half of the 258 million male Internet users, and the partiality is more apparent in rural India. States like Kerala, Tamil Nadu and Delhi have a higher proportion of female Internet users as compared to male users.

Let's have a look at the few of many initiatives taken by the government of India. A few and popular ones are mentioned below:

Aadhaar: *The largest biometrics based identification system in the world, Aadhaar is a strategic policy tool for social and financial inclusion, public sector delivery reforms, managing fiscal budgets, increase convenience and promote hassle-free people-centric governance.*

Aadhaar Enabled Payment System: *AEPS is a bank led model which allows online interoperable financial inclusion transaction at PoS (MicroATM) through the Business correspondent of any bank using the Aadhaar authentication.*

BHIM (Bharat Interface for Money): *Bharat Interface for Money (BHIM) is an app that makes payment transactions simple, easy and quick using Unified Payments Interface (UPI).*

Crime and Criminal Tracking Network & Systems (CCTNS): *Crime and Criminal Tracking Network & Systems (CCTNS) is a plan scheme conceived in the light of experience of a non-plan scheme namely - Common Integrated Police Application (CIPA).*

Digilocker: *DigiLocker is the Indian Government's flagship program aimed at transforming India into a digitally empowered society and knowledge economy. DigiLocker ties into Digital India's visions areas of providing citizens a shareable private space on a public cloud and making all documents/certificates available on this cloud.*

Digital Saksharta Abhiyaan (DISHA): *The Digital Saksharta Abhiyan or National Digital Literacy Mission (NDLM) Scheme has been formulated to impart IT training to 52.5 lakh persons, including Anganwadi, ASHA workers and authorised ration dealers in all the States/UTs across the country. The initiative aims at training non-IT literate citizens to become*

IT literate to enable their active and effective participation in the democratic, developmental process, and enhance their livelihood too.

ePATHSHALA: *Developed by NCERT, ePathshala for showcasing and disseminating all educational e-resources including textbooks, audio, video, periodicals and a variety of other print and non-print materials through website and mobile app.*

eSAMPARK: *e-Sampark is a mechanism to connect the government directly with citizens across India by running mailer, outbound dialing and SMS campaigns. The platform is used for sharing informational and public service messages.*

eVISA: *The Ministry of Tourism supported the initiative regarding the implementation of Tourist Visa on Arrival enabled with Electronic Travel Authorisation. (Source: <https://digitalindia.gov.in/di-initiatives>)*

Gender Equality

Gender equality can be better understood as a hopeful journey to empowerment of half of the population in the world irrespective of geographical locations and social, economical classes and categories because every individual deserves an equal opportunity for growth. If digital world is a reality and holds a key for forward growth of folks around the world then it should be given to everyone as a tool free of cost and create mechanism so that it is realized in a proper time frame. There are some issues that have a strong connection with the realization of gender equality. We should also take into consideration the amount of control they have over the available resources and their utility. In addition to this the decision making powers are also a criteria to understand the truths behind the terms. Related are the terms of race, social class, economical status, ethnicity, religion, age and factors of disability.

We are but to consider that the age we live in is an age of transformation where there is lot of technological progress and a shift beyond time that is eager to catch all kinds of changes. Some of them are vulnerable for the present and coming generations too but that all is unstoppable.

Not let us check the quantitative data the world has to present us when we compare the digital literacy of the population.

Digital India is a flagship programme that seeks to transform India into “a digitally empowered society and knowledge economy” by 2018 (Government of India Cabinet, 2014). It was approved by the Union Cabinet in August 2014 with the objective of providing “intensified

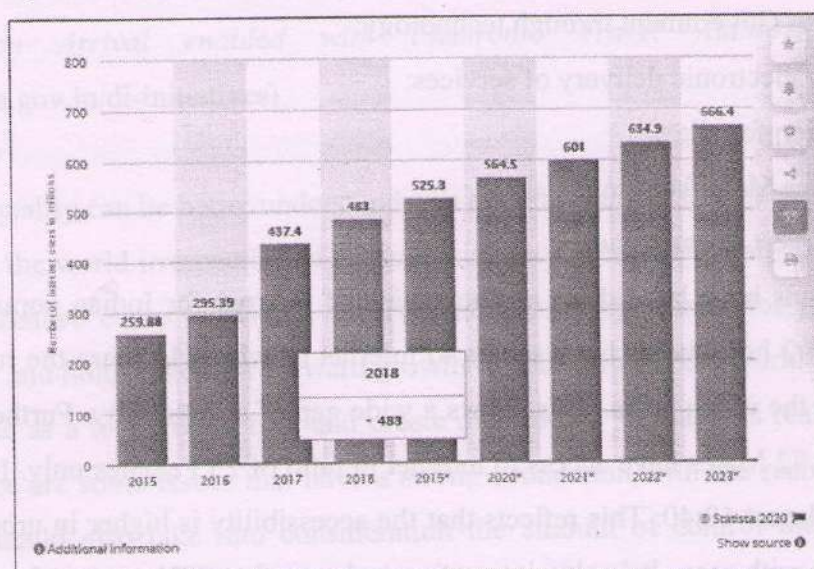
impetus” to existing e-governance initiatives and promoting “inclusive growth” by leveraging new manufacturing and job opportunities, especially in electronic manufacturing and IT-enabled services (ibid). The focus of the programme is defined in terms of nine key areas, termed the “programmatic pillars”. They are summarised below (Department of Electronics and Information Technology, 2014). The efforts by the Government of India mentioned below are commendable in the case if the digital gap is to be overcome. It has following nine pillars to go by:

1. Building national broadband highways
2. Universal access to mobile connectivity
3. Public Internet access programme:
4. Reforming Government through technology:
5. E-kranti / electronic delivery of services:
6. Information for all:
7. Electronics Manufacturing
8. Early Harvest Programmes

Investigations have been done on the access of internet for Indian population and it is found that only 15.2 households have access to internet of which 15.6 are the rural households and 72.5 are from the urban areas. This shows a wide gap of accessibility. Further compared, in case of rural india 72 Males have access to internet in ratio of 25 Females only. In case of urban area this ratio is almost 60:40. This reflects that the accessibility is higher in urban womenfolks but still not at par with men. It is also interesting to know that 98% women have reported that Facebook is a commonly used platform. It does show that where there is ease of accessibility, it is used for trending and common causes of being found on social media platforms. Only 49% women have found links outside Facebook, 17% are seeking information on health, rights, development projects, etc; 4% have reported that they have found important information about seeking a job and only 1% have found a support through online available networks. This data is enough to reflect that mere availability of internet access is not a sufficient area to discuss rather the factual position of what kind of benefits the user has received.

WORLD INTERNET USAGE AND POPULATION STATISTICS						
2019 Mid-Year Estimates						
World Regions	Population (2019 Est.)	Population % of World	Internet Users 30 June 2019	Penetration Rate (% Pop.)	Growth 2000-2019	Internet World %
Africa	1,320,038,716	17.1 %	522,809,480	39.6 %	11,481 %	11.5 %
Asia	4,241,972,790	55.0 %	2,300,469,859	54.2 %	1,913 %	50.7 %
Europe	829,173,007	10.7 %	727,559,682	87.7 %	592 %	16.0 %
Latin America / Caribbean	658,345,826	8.5 %	453,702,292	68.9 %	2,411 %	10.0 %
Middle East	258,356,867	3.3 %	175,502,589	67.9 %	5,243 %	3.9 %
North America	366,496,802	4.7 %	327,568,628	89.4 %	203 %	7.2 %
Oceania / Australia	41,839,201	0.5 %	28,636,278	68.4 %	276 %	0.6 %
WORLD TOTAL	7,716,223,209	100.0 %	4,536,248,808	58.8 %	1,157 %	100.0 %

Source: <https://www.internetworldstats.com/stats.htm>, accessed on 25 December 2019



Source <https://www.statista.com/statistics/255146/number-of-internet-users-in-india/> 25 December 2019

The rising number actually gives us a complete picture of the present situation in India. The growth is also because of the rising number of handy gadgets that are available to everyone. Sometimes it is felt that it is the user who is persistently searching the internet rather than the service providers searching for users. We are second to China in case of using internet as a means for different purposes but the statistical data has enough to tell us about the gender parity.

Efforts are required to improve the use for fruitful reasons and the gender disparity can be really defeated. A few taken up by the Government of India again needs to be popularized.

Initiatives like, Helplines and panic buttons, Web channels for reporting sexual harassment at workplace, #Helpme WCD Twitter campaign Email ids and social media accounts for addressing online gender-based violence, MIS for incentive-based payments for ASHAs, Digital Gender Atlas for Girls' Education, Digital monitoring systems in employment and

welfare schemes are a great support that additionally helps women to go active internet users and technology enabled citizens.

We can yet support some of the best and often thought initiative by organizing brainstorming session on the topic. We will have to avoid that Males do not take control over the resources and are a part of such sessions where they are the masters of mind. Let Females think over what best suits to them from a 'gender-based' point of view and come up with the fresh and new solutions on bridging the gap. Let them be the decision makers of their live and aspects related to their own empowerment and this will actually bring the desired results.

Lets Begin at Home

We can always think of Digitally Enabled Information Outreach System For Women, E-Learning And Knowledge Intervention System For Women, Digitally Monitoring System For Women Directed Services, Technology Supported Crisis Support System are some of those vital areas where there is always a scope to think of having a transformation. Unless the bridging is done there would never be half of the population supporting the growth of the nation neither the world.

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Multiculturalism in Paulo Coelho's *Eleven Minutes*

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Abstract

Respect for a culture means respect for a community's right to its culture and for the content and character of that culture. Since every culture gives stability and meaning to human life, hold its members together as a community, displays, creative energy and so on, it deserves respect. Multiculturalism as a social theory brings together different themes such as cultural diversity, recognition, mutual concern, and peaceful co-existence of many cultures and sub-cultures. Multiculturalism is best understood neither as a political doctrine with a programmatic content nor a philosophical school with a distinct theory of man's place in the world but as a perspective on or a way of viewing human life. In this novel multicultural aspect such as identity, recognition, freedom, liberty and equal position in the society of women is discussed in a broad way.

Key Words: Identity, Recognition, Freedom, Liberty and Equal Position

Introduction

Multiculturalism as a social theory brings together different themes such as cultural diversity, recognition, mutual concern, and peaceful co-existence of many cultures and sub-cultures. The term '**multicultural**' refers to the fact of cultural diversity and the term '**multiculturalism**' to a normative response to that fact. Multiculturalism is not a single principle of policy, **but an umbrella** of highly group-differentiated approaches and each of these approaches is multi-dimensional, incorporating economic, political and cultural elements in a variety of ways. Multiculturalism is best understood neither as a political doctrine with a programmatic content nor a philosophical

school with a distinct theory of man's place in the world but as a perspective on or a way of viewing human life. A culture's relation to itself shapes and is in turn shaped by its relation to others and their internal and external pluralities presuppose and reinforce each other. A culture cannot appreciate the value of others unless it appreciates the plurality within it: the converse is just as true. Closed cultures cannot and do not wish or need to talk to each other. Since each defines its identity in terms of its difference from others or what it is not, it feels threatened by them and seeks to safeguard its integrity by resisting their influence and even avoiding all contacts with them. A culture cannot be at ease with differences

outside it unless it is at ease with its own internal differences. A dialogue between cultures requires that each should be willing to open itself up to the influence of and learn from others, and this presupposes that it is self-critical and willing and able to engage in a dialogue with itself. A multiculturalist perspective is composed of the creative interplay of these three important and complementary insights-namely the cultural embeddedness of human beings, the inescapability and desirability of cultural plurality and the plural and multicultural constitution of each culture. Respect for a culture therefore means respect for a community's right to its culture and for the content and character of that culture. Since every culture gives stability and meaning to human life, hold its members together as a community, displays, creative energy and so on, it deserve respect. **As Charles Taylor** correctly observes, **social recognition** is central to the individual's identity and self-worth and misrecognition can gravely damage both. This raises the question as to how the demeaned minorities can secure recognition and here Taylor's analysis falters. He seems to take the rather naïve liberal view that the dominant group can be rationally persuaded to change its view of them by intellectual arguments and moral appeals. Misrecognition has both a cultural and a material basis. It therefore, can only be countered by undertaking a rigorous critique of the dominant culture and radically restricting the prevailing inequalities of economic and political power. **Multiculturalism tries to restore a sense of wholeness in a postmodern era that fragments human life and thought. Tariq**

Modood argues that in the early years of the 21st century, multiculturalism “**is most timely and necessary**, and ...we need more not less”, since it is “**the form of integration**” that (1) best fits the ideal of egalitarianism (2) has “the best chance of succeeding” in the “post -9/11, post 7/7” world, and (3) has remained “moderate and pragmatic”.

Eleven Minutes departs somewhat from the Coelho formula. He apologizes to his devoted readers in a chatty foreword. This is a novel, we are warned, and that will deal with "a subject that is harsh, difficult, shocking": the international crime of "people trafficking". The heroine, Maria, is a surpassingly beautiful virgin from the Brazilian back-country. She runs off to Rio where she is tricked into going as a "dancer" to Geneva. There she descends into prostitution. Thus outlined, *Eleven Minutes* might seem to promise an exposé of **white slavery**. It doesn't. Maria's experience with the dour punters of Switzerland is as much a voyage of wonderful discovery as Santiago's treasure hunt in *The Alchemist*. Through the sex industry, Maria uncovers the core truths of the human condition. In the process, she saves her "soul"; she also saves a useful bank balance. Her rate for 11 minutes (life is not the only thing that moves very fast) is 1,000 Swiss francs. After a year she is able to retire, healthy, wealthy and wise (don't all foreign prostitutes?). Here Maria traveling one place to another for a search of pleasure, adventure and fulfilling her dream. In this story she faces more problems but she overcome on it and found her own identity. She recognized herself while struggling and meeting various kinds of people of different

behaviour. Her struggle for getting the pleasure is shown in this novel. People misrecognize her from her profession. When she entered in the profession of prostitute she met various kinds of people who belong to different culture. When she was meeting the customer they also belong from different culture, religion and language which indicate the notion of multiculturalism in the novel.

Maria was a protagonist of the novel. She belongs to very poor family. Her father was a travelling salesman, her mother a seamstress and her hometown in the interior of Brazil, had only one cinema, one nightclub and one bank. She fell in love for the first time when she was eleven, en route from her house to school. Three year passed, she learned geography and mathematics, she began following the soaps on TV, at school, she read her first erotic magazines and she began writing a diary describing her humdrum life and her desire to experience first-hand the things they told her about in class-the ocean, snow, men in turbans, elegant women covered in jewels. She fell in love with boy twice and thrice. She met so many boys in her life in search of love by sharing their habits, behaviours and culture and observed it very minutely. This is the impact of multiculturalism she wrote in her diary-

'Life moves very fast. It rushes us from heaven to hell in a matter of seconds'. (09)

Maria met the man who couldn't speak Portuguese language but he offered her drink, she drank and smiled at him. Sometime, they kept up this comfortable, meaningless conversation. But she

understood the language of humanity and understood him. She spoke her language by using the small red dictionary which indicates the part of **multiculturalism**. She met various customers of different language, race, culture and religion. She shared the culture at the same time. She travelled from Brazil to Switzerland for sake of pleasure. She met a lots of foreigner some are trustworthy some are not. The interpreter told her that her that he would not be accompanying. Don't worry about the language, what matter is whether or not he feels comfortable with you. It is indication of multiculturalism. **Mailson**-the name of the interpreter-cum-security officer-assured her that in Rio de Janeiro and the rest of the world things were different. **Maria** realized that all **European** are same: they come over here and imagine that all Brazilian women are really sensual and know how to samba. **Swiss men** obviously had too much money and not enough women back home. He is ready to pay three hundred dollar a night. Mailson, the interpreter-cum-security officer discussed with Swiss man and Maria accepted the Swiss man's offer and ready to work in his country. She needed a piece of paper proving that no one there could do the job she was proposing to do. She had a documents provided by the Swiss consulate. Security officer-cum-interpreter-cum-agent demanded a cash advance as soon as the contract was signed, thirty per cent of the five hundred dollars she received. Through this it shows that she faced a lot of problem to settle her life. This is the struggle for recognition sometime she become misrecognize because of her profession in the eyes of the people. Here the term

'identity of recognition' work which done by *Bhikhu Parekh*.

She travelled and the idea of going far away had just been a dream and dreaming is very pleasant as long as you are not forced to put your dream into practice. That way, we avoid all the risks, frustration and difficulties and when we are old, we can always blame other people-preferably our parents, our spouses (wife) or our children-for our failure to realize our dreams. Maria consoled herself with the thought that she could change her mind at any moments; it was all just a silly game. She lived more than a thousand kilometers from there and she now had three hundred and fifty dollars in her purse. She decided to pack her bags and run away, there was no way they would ever be able to track her down again. She decided to go for a walk on her own by the sea, where she looked at the children, the volleyball players, the beggars, the drunks, the seller of traditional Brazilian artifacts (made in china), the people jogging and exercising as a way of fending off old age, the foreign tourists, the mother with their children and the pensioners playing cards at the far end of the promenade. By looking this she learnt the behaviour, habits and culture of human being and ready to fight with situation which is created by interpreter/agent. She had come to Rio de Janeiro, she had been to a five-star restaurant and to a consulate, she had met a foreigner, she had an agent, she had been given a present of a dress and a pair of shoes that no one absolutely no one, back home could ever have afforded. She headed in a slightly more northerly direction; she would end up in the enchanted kingdom

known as Europe with its Eiffel Tower, Euro Disney and Learning Tower of Pizza. Forty-eight-hour journey back home in a bus with no air conditioning and as long as the Swiss man didn't change his mind. Maria realized with a mixture of fear of relief that he was serious about what he said. Maria explained that she couldn't take a decision without first consulting her family. The Swiss man was furious and showed her a copy of the signed contract and for the first time she felt afraid. Maria used full freedom of life and took her own decision about life and faced lots of problem at the same time fight for creating his own identity in the unknown place in Europe. This approach explained the issue of multiculturalism in this novel where character fight for freedom, liberty and equality to get her right position in the society.

Maria's mother told her that "my dear, it's better to be unhappy with a rich man than happy with a poor man". She enrolled in a French course that was run in the morning, and there she met people of all creeds, belief and ages, men wearing brightly coloured clothes and lots of gold bracelets, women who always wore a headscarf, children who learned more quickly than the grown-ups, when it should have been the other way round, since grownups have more experience. Maria might be young but she was no fool, especially once her Arab lover had told her that Swiss employment laws were very strict and since the nightclub kept back a large part of her salary, she could easily allege that **she was being used for slave labour**. She felt with a few insult and five thousand dollars in compensation-a sum of money beyond her wildest dream- and all

because of that magic word 'lawyer'. She was working in the brothel and they were using her as a slave but Maria realized it and stated to rebel against it to get freedom and liberty at the same time equal position in the women of brothel. In Brazil Maria had read a book about a shepherd who, in searching for his treasure, encounters various difficulties and these difficulties help him to get what he wants; she was in exactly the same position. Maria became a regular visitor to the library, where she would chat to the woman, who seemed as lonely as she was, ask her to suggest more books and discuss life and authors-until her money had nearly run out. She had come in search of adventure, money and possibly a husband. She had always been preoccupied with what other people were thinking, her mother, her school friend, her father, the people at the model agencies, the French teacher, the waiter, the librarian, complete stranger in the street. Maria was meeting the various kind of Asiatic-looking women and discussing with them the life of bar with the alluringly Brazilian name of 'Copacabana'. There was Colombians, Thais, Peruvians, Brazilians all loved the money. This is also a symbol of cultural diversity in the brothel where different racial, cultural and social issues were handled. She began asking for books about marital problems, psychology and politics; the librarian was delighted to see that the young woman of whom she had grown so fond had stopped thinking about sex and was now concentrating on more important matters. Maria met various kind of customer these are so powerful and arrogant at work, constantly having to deal with employees, customers, suppliers,

prejudices, secrets, posturing, hypocrisy, fear and oppression, ended their day in a nightclub. She was beginning to realize that after long months of self-control, the pressure, the earthquake, the volcano of her soul was showing signs that it was about to erupt and the moment that is happened. Pain was no longer a cause of suffering but a source of pleasure because they were redeeming humanity from its sins. Pain became joy, the meaning of life, pleasure. Maria is playing the role of teacher, friend, philosopher, mother and guide in this novel. She was no longer the teacher, the one who instructs, consoles, listens to confessions and the one who excites; before the awesome power of this man, she was just a girl from the interior of Brazil. Maria realized that someone only know herself when she go beyond your limits. It was an adventure like the Ulysses and she could decide later on if she wanted to continue, but at that moment, she had ceased to be the girl with just three aims in life, who earned her living with her body who had met a man who had an open fire and interesting stories to tell. She connected with various customers in the club who belong to different region, custom and tradition and language which signify the term multiculturalism in this novel. Terence was a Ulysses who had travelled from London, a Theseus come down from the heavens, a kidnapper invading the safest city in the world and who had the coldest heart of earth. One of her exhibition took her to Japan just when she was immersed in what she called 'Pain, suffering and pleasure. The Greek historian, Herodotus wrote of Babylobia: they have a strange custom here

by which every woman born in Sumeria is obliged at least once in her lifetime, to go to temple of the goddess Ishtar and give her body to a stranger as a symbol of hospitality and for a symbolic price. It indicates that how bad traditions were presets in the society and women victimized because of this and these traditions continue in the light of brothel. So the Maria is a true representative of these backward women who did not get their rights. The influence of the goddess Ishtar spread throughout the Middle East, as far as Sardinia, Sicily and the Mediterranean ports. Maria had had only four adventures-beings a dancer in a cabaret, learning French, working as a prostitute and

falling hopelessly in love. The true story of a Brazilian Prostitute, her marriage, her problems with the law and her various adventures.

In this novel Maria play with so many customs, tradition, culture, religion through the customers in Copacabana Bar. She learnt various languages to deal with customers. She also shared their culture and thought to get them peace and satisfaction. She struggled at lot and overcome all obstacles in her life and fights for the recognition and the identity. The aspect of recognition, identity, freedom, liberty and equal position in the society works in this novel which indicates the part of multiculturalism.

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RE-VITALIZING OF INDIAN ECONOMY FROM THE GRASSROOTS E-COMMERCE FOR RURAL INDUSTRIES

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A general survey shows that the major contributory factors to the growth of e-trade industry in India are quicker adoption of new technology and faster appropriation of new innovations like the web and cell phones. But let us take a look onto how this technology has benefitted the rural areas where there is a brisk business all the time round the year. Though technology has been perhaps the greatest driver of E-business in India and around 402 million individuals in India are by and by utilizing the Internet how far that all has improved the grassroots. In the very few next years, the number is additionally expected to arrive at 500 million clients by 2017. We are still a fastest growing economy among the quickest developing economies all around and higher pay levels have made India one of the quickest developing shopper advertises on the planet too. Have we but added value to the existing 70% of the total population of the nation is a big issue to discuss. The glitter does not allow to look beyond what is available and shown but becoming forgetful of the major portion of population and their needs will really not add any worth to the scene. Rising extra cash, changes in way of life and shopping designs are a portion of the components that have demonstrated instrumental in driving the E-trade industry in India.

The paper will focus on how the existing or at some places dying economies can be revived and put into the mainstream simultaneously by looking into the existing gateways of knowledge as reference material. It is natural that efforts from all the corners of knowledge base, viz. academics, hospitality, health, etc will be required for sure.

E-Commerce is buying and selling of goods and services or transmitting of funds or data, over an electronic networking, primarily the internet. These transaction occur either business to business, business to consumer, consumer to business and consumer to consumer. E-Commerce is done using applications EDI, email, shopping carts, Digital commerce makes possible for purchasing transaction over the web and supports creation and constant growth of online relationship with customers across multiple channels like retail, mobile, direct and indirect sales etc.

In a detailed writing on 'Changing Structure of Rural Economy of India Implications for Employment and Growth' by Ramesh Chand, S. K. Srivastava and Jaspal Singh (National Institution for Transforming India NITI Aayog) we come across a bunch of interesting information. A particular area of the major pockets available along the length and breadth of this subcontinent has a picture that is altogether appealing whereas in other sectors there are still larger vacuums marring the total picture.

In case of agricultural production, the commitment of agribusiness in rural produce has declined step by step. But that did not create worry for many because it opened up many other sources of investment. This



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is viewed as an attractive change for the advancement in monetary improvement. In any case, over-reliance on agribusiness for work developed as a significant test. Between 2004-05 and 2011-12, India first time saw decrease in workforce in agribusiness. The pace of decrease was 2.04 percent. In spite of this, farming utilized 64 percent of the all out provincial workforce who created just 39 percent of the all out rural produce during the year 2011-12.

It is evaluated that for bringing union between the portion of horticulture in complete yield and business, 84 million agrarian laborers were required to be moved to non-ranch divisions in country regions in the year 2011-12. This added up to just about 70 percent expansion in non-farm business, which looks very testing. Assembling Manufacturing yield in rustic territories enrolled yearly development pace of 5.18 percent between 1970-71 and 1993-94. The post-change period (1993-94 to 2004-05) saw higher development pace of 8.38 percent, which further quickened strongly to 15.87 percent during 2004-05 to 2011-12. A SWOT analysis of the entire scenario brings us the following picture.

STRENGTHS: Significant Contribution to the Indian Economy, High Export Potential , Strong Local Brand Image, Low Operating Costs

WEAKNESSES: Low Technology Absorption, Poor Marketing & Branding, Low Use of Information Technology, Low Capacity Utilization, Lack of Adequate Funding, Lack of Management Skills

OPPORTUNITIES : India's Positive International Image • Bilateral & Multilateral Trade Agreements, International Marketing Support from Export Promotion Councils, Technology Up-gradation Support.

THREATS: International Competition, Competition from Domestic Enterprises , Market Demand for Better quality, Late Payments from Buyers

Most of these reading may not be in the actual context of the rural economy but at a lower scale they can be seen in a positive make as these are the issues which generally controls the growth of the economy.

A few steps can revitalize the grass-root economy without any doubts.

Improving Easy-to-utilize Technologies: The E-trade organizations in India have been concentrating on growing new applications reasonable for mobiles/advanced cells, empowering clients to make online exchanges through their gadgets effortlessly. Versatile applications have additionally helped organizations to improve their topographical effort and increment their correspondence level with the end-clients through trade of standard assistance updates and messages. Likewise, computerized promotions have additionally empowered E-business players to connect with a more extensive crowd/clients. While E-business organizations in India offer different installment alternatives, the vast majority of the players have been offering 'money down' choice to clients, regardless of bringing about higher organization costs by virtue of such exchanges as this is the most favored method of installment among purchasers. A few of these steps can really be of great help to connect the rural industries with the market nearby or at the national or global level. Honest efforts are required to penetrate the simple technology down to the illiterate or semi literate masses and they can work wonders. There have been cases reported for such upgradations of local artisans and makers. The GI based products too can be put into the big vessels of e-commerce industries and there can be a new dawn to the rural lot.



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There are many other initiatives taken by the government. One of the exceptionally yearning and greatest at any point imagined ventures is 'Advanced India' which centers around changing India in to a carefully enabled and information economy. The three key territories that have been distinguished are to construct advanced foundation as a center utility, empower government resident administrations on request and computerized strengthening of residents. With the help of this, even the grass-root people can be connected to the wider network of market and economy. The local products can be imagined on computer screens and can be sold to far corners of the word that would bring a great relief to everyone who is connected. The digital transfers and exchange of money not only primarily will serve the purpose of removing the lines of poverty but also the e-learning will make them all into able individuals who are ready to face the changes worldwide in a much better way.

Start-up India: This program expects to fabricate a solid eco-framework for sustaining 'development' and 'exponential new companies'. The legislature of India has made strides, for example, giving financing support through a 'Store of Funds' (with a corpus of INR 100 billion); (1.5 billion US \$) 'Start-up India center point', a solitary point contact for the beginning up biological system, charge exceptions for the underlying three years and quicker exit for new companies. Under this programme, not only the struggling economies have supported themselves and brought a new lease of life but also have set better examples for many educated but unemployed youths across the country. This also has brought a new lease of life to the beginners in different fields across the rural productions, its finishing and making simple techniques into machineries that have brought simple but remarkable changes in the lifestyle of the rural lot. It is due that these simple steps might not have added too much to the cashflow but they have really made it possible to make its presence felt wherever possible and also in cases where there was complete darkness or absence of cash.

Make in India: Aimed at India's mechanical advancement, the key advances taken by the legislature of India are improving the business condition and empowering fabricating, and permitting FDI in key segments. Key mainstays of this program are 'research and advancement' and 'helpful business condition'

Expertise India: To connect the deficiency of gifted labor, the legislature of India has set an objective to prepare 400 million individuals under the new 'National Policy for Skill Development' by 2022.

The E-Commerce showcase has seen unrivaled development since a year ago, It is normal that E-commerce will become \$20 million constantly 2018. With expanded utilization of advanced cells, tablets and web, online business has gotten generally available to both urban and country clients. Outside organizations are putting tremendous entireties of cash into Indian organizations. Experienced universal players are looking into Indian organizations. Ecommerce is developing in country territories with a large portion of the traffic originating from level 2 and level 3 urban areas. In July 2014 Amazon put \$2 billion in India, following the updates on Flipkart bringing \$1 billion up in financing. There are parts of greater organizations in internet business advertise like Snapdeal, Flipkart, Amazon, Shopclues and Jabong, etc.

With numbers of companies increasing the competition is bound to happen for the first position. The retail industries have recorded annual growth of 40-50%, huge investments is expected to flow into logistics sector in future. Many offline brick and mortar companies are slowly moving to online business and those who are not in online commerce business will be forced to come online. The commerce



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industry is in nascent stage, more niche ecommerce companies are joining the competition. The customer is winning and there is pressure to deliver best to the customer.

Through a discussion, we can always think of some key drivers for boosting the rural framework.

1. education to the rural masses for participating in the neighborhood market economies, that will further lead them to the state, national and global platforms.
2. Improving the knowledge of communication in at least one widely spoken or foreign language that will help them to know and execute simple plans for their livelihood can be a great addition. They will also be given to the knowhow on facets of economy.
3. The cost of means of communication for such rural set ups that will boost them to connect to the larger markets needs to be worked out. If the cost of gadgets remain higher for a long or contemporary period that would be affecting them all in a negative way. They will develop fear of entering into the process and would never be a part of the mainstream economy; neither they will improve on the lifestyle.
4. Special editions of Smart-phones, I-pad and tablets to promote understanding of the world around would be a great help to the rural sector.

India has greater prospect of market potential with E-Commerce industry growth doubling every year. The sector has grown in E-Travel which accounts of 70% of total commerce. E-commerce caters the need of young population which are under age of 34. Morgan Stanley noted that the market of E-Commerce will rise to \$137 million by the year 2020. India's annual household income has increased in the fiscal year 2015 of the total 246 million household in India. The statistics indicate that household income is expected to reach \$3823 in 2015 and become \$6790 in 2020. India's E-Commerce market is on route to become largest market in world.

Online shopping has been trending high since a decade and there are no fears to walk into the bigger network of selling and buying. There are transparent methods, perks for purchase and easy and flexible modes of payment, linked bank accounts that has added lot of happiness among the buyers. The utilization of PDA and tablets development will keep on developing each year. India has in excess of 100 million clients and its shipment from US has multiplied since a year ago.

There is another issue that requires a parallel attention and that is investment in rural set up. There are opportunities in case of acquisition of land and some local resources such as cheaper labour required to function any industry and that can be mobilized in a much better way. There are popular mechanisms like ease of doing business floated and executed by government of India where investors are attracted but that has not really brought a lot of shine into the existing market. Latest this year we could notice that even the reserved funds of RBI were demanded by the government to put in little strength to the weakened structure of economy and also to assure buyers and sellers that they still have good way to go in case of Indian economy, but that also did not succeed to a larger extent.

Since a year ago trade enterprises have verified over \$3.9 billion speculation from investor and private value firms and inside funders. Chinese E-Commerce organization Alibaba bunch holding and its accomplice Zhyian commonly put about \$575 million in One97 correspondence Limited additionally known Patym. At present Patym[19] is doing billion Gross Merchandise esteems which is gigantic total for any internet business done by any Indian organization. Paytm offers portable installment, in addition to it permits client to purchase tickets, arrangements and shop from its 1800 dealers in its system. After Alibaba venture Paytm got award from Ratan Tata for an undisclosed sum.



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The online retail showcase is expanding at the pace of 3% of the total business industry. E-Traveling organizations are taking the lion portion of complete internet business showcase which is about 70% of all out trade. This size is relied upon to expand further to about \$17.32 billion. The retail showcase is in developing stage and its clients are required to arrive at 300 million customers inside 10 years. A large portion of the individuals favor money down which is a test for the development of retail industry.

One of the most primary needs of the making over the rural economies is the absence of Logistics Infrastructure. A much better presence of the best productions available in the villages and semi urban areas fail to reach to the customers right in a direct manner for the absence of the transport and logistic support. A midway connectivity hubs can be of great help to all. A cluster of some of the well doing and suitable firms can be made to be judged with government run control mechanism to assure a much needed connectivity. Some E-Commerce organizations have worked in coordinations part, for example, E-Kart of Flipkart, Amazon coordinations of Amazaon. Outsider coordinations organizations profit by increment in number of requests. These delivery firms and other connected subsidiaries can be tied well with a sole objective to thrust little on the rural economy. They can be given some additional relaxations and concessions if they are connecting to the rural market, farmers, artisans, etc.

The greater part of universal organizations have their own coordination offices which are supported by government e.g. China, which isn't if there should be an occurrence of India. Another significant obstacle is planes accessibility for production network. During celebration season various shipments heap up at air terminal accordingly conveyance is impossible at booked time. Conveyance of products is tough errand in a nation like India where there are a great many clients having huge numbers of postal district. It incorporates parcel of administrative work for good to move from one state to another. It is at this juncture that we should think of some better methods to involve people from the rural parts.

Key Challenges in connecting the rural economy with the major ones:

Ecommerce companies need to address many issues such as:

1. Strengthening logistics infrastructure and service levels in ecommerce market as warehousing requirement will increase in coming years with increase in ecommerce activity in coming years. In case of cross border ecommerce there exist problem of reverse logistics.
2. Security, privacy breaches and fictitious transaction issues need to focused as ecommerce is moving to mobile platform.
3. Rules and regulations for taxation and pricing of product for international and local companies .There should be throughout discussion regarding complexities of tax evasion, FDI, and loopholes in commerce between government and various competent ecommerce companies.
4. Customers are concerned about security when it comes to use of credit and debit cards so they are hesitant doing online transactions .Thus cash and delivery is preferred mode of payment which is expensive and risky.
4. Companies need to adopt to change in technology shift from laptop to mobile. They should provide multi channel sales coupled with fast browsing experience along with after sales support and service. Online reviews, videos, return, product comparison should also be provided to enhance mobile experience.

In coming years all the more prominent mergers and acquisitions are relied upon to occur in computerized trade part. Eventual fate of web based business looks encouraging on the grounds that more and organizations will put resources into private venture new businesses. Internet business speculation list



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was large in India a year ago, greater venture are normal in coming years. Online networking has become showcasing place for vendors where they can publicize and advance their item openly. The development of versatile systems and web based life in business will take web based business to new skylines that will change online retail showcases in future.

Internet connectivity has become basic obligation in not only urban cities but also in rural ones. The rapid growth of ecommerce is challenged by legal hassles, logistics and many factors which need to be addressed sooner.

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SKILLING ACADEMICS: INNOVATIONS AND EMPLOYMENT IN INDIA

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ABSTRACT:

India's populace is immense and is quick extending and coordinating quickly into the worldwide economy. India is among the 'youthful' nations on the planet, with the extent of the work power in the age gathering of 15-59 a long time. In any case, by and by just 2% of the complete workforce in India has experienced aptitudes preparing. India has an extraordinary chance to fulfill the future needs of the world and can turn into the overall sourcing center point for talented workforce. Any experience of life that outcome in learning is instruction. Tutoring is an arrangement of what's more, sorted out realizing process. The aptitudes transmitted by an imaginative leader to his fellowmen, by a mother to her kids are likewise a type of training that may result in straightforwardly beneficial and substantial encounters or lead to the advancement of attractive tendency forever.

As academicians and researchers, we all have been known to two kinds of instructions viz, formal and informal. There are programs for formal tutoring. They build some aptitude among individuals and help improve economy but on the basis of a non-skilled workforce working under their instructions. Mostly when such arrangements are followed, the results are not as much desirable as they should have been. The other category where there is a skilled workforce plans its own business or deposits faith in the superiors for a comprehensive growth of the organization they work in, generates wonderful results. The combination of skilled authority and skilled workforce creates this effect.

Introduction:

As formal education is provided throughout country and in most of the parts with sophisticated gadgets and technology now a days, the learned lot forms the creamy layer. The requirement of the skilled workforce falls short most of the time when there is a demand for them. The reason is



that, there are people interested to invest money on the formal education but very less people to invest in informal or skill based education. There is insufficient sensitization on the issue and we should be aware of the fact that lesser we are at the skill sector, weaker we grow at economy.

The speed of development is setting enormous requests on the Indian training framework. It should build up a fittingly talented workforce that can meet the ever-changing human asset prerequisites industry is making. Thus, India is quick turning into a worldwide center for ability. It is amazingly troublesome, if certainly feasible, for an instruction framework to react to these difficulties rapidly and justified ways – especially in a nation as enormous and as various as India. The instruction framework is battling to address critical issues around essential abilities. Global pursuit for Sustainable Development Goals (SDG) has brought the Higher Education on the forefront of the Developmental Agenda across the world. It is primarily because of the increasing role which knowledge plays in development and more so because of the rapid pace at which knowledge gets generated and becomes obsolete.

Industry Academia Gap: Need for Realization

One of the fundamental causes is a feeble useful connection between yield of instructive framework and prerequisites of occupation. The circumstance has pulled in the recharged consideration of arrangement producers keeping in line the sustainable development goals. Draft New Education Policy of India underlines that frail linkages among University and Industry is one reason for poor innovative work. It is progressively being understood that organized information made in the Universities should mix with the implied information on the Industrial Workforce. Such a combination of information and encounters will assist with quickening Industrial development. Then again, it will likewise assist the scholarly community with furthering investigate original innovations for expanded asset and vitality proficiency. To encourage a compelling interface among the scholarly community and industry, a few strategy activities have been recommended which remembers the arrangement of having representation from industry for Governing assortments of advanced education organizations.

Further, Industry's activity augmentation impact positively affects society. It has been evaluated that each one activity in assembling makes 2.2 employments in different areas (UNDP site). Subsequently a solid practical reliance among the scholarly world and industry is a formative objective. A frail scholarly world industry linkage will make industry unequipped for supporting other imperative parts of advancement.

CSR: A New Avenue for Growth



Corporate Social Responsibility (CSR) has offered ascend to fascinating potential outcomes of coordinated efforts between educational institutions and Corporate Houses. The ability and capacities of academic foundations to convey instructive items in remote and distant can pull in the CSR ventures. The corporate houses can support inventive community oriented tasks to upgrade their essence in such regions. While educational institutions will have the option to improve their compass up to unreached zones, the Corporate Houses will have the option to procure brand loyalties in such virgin zones. Such union of interests between educational institutions and Corporate houses should be completely investigated.

It is always possible that Indian population have essential effect for SDGs. The significant fragment of Indian Population will keep on being youthful now and in coming 15-20 years. Also India is required to be the quickest developing economy on the planet during this period. Industry and service segments are coming up in a major manner with expected and higher commitment of GDP by 2030. A report entitled "Advanced education in India: Vision 2030" of FICCI Higher Education Summit 2013 features that normal development will require net gradual workforce of 250 million given retirements/drop outs. Indian Higher Education has a duty to supply significant portion of this work power.

Remarkably, India will have a work overflow of a great extent youngsters in 2030 with a middle age of 32 years. These patterns have an extensive effect for SDGs essentially in light of the fact that rest of the world is maturing quick. In the event that appropriately talented such youthful workforce will have the option to react to the enormous human asset required to satisfy the requests of work lacking markets far and wide.

Subsequently, Indian Higher Education of 21st Century needs to create as a High Quality, Equitable and Affordable for the youngsters of the nation. Indian Higher Education ought to be created as best on the planet as well as best for the world. Henceforth, a powerful practical connection among industry and the scholarly world is a formative basic which needs to confront the monstrous test to set up its young populace for the worldwide economy. The powerful interface among the scholarly world and industry will upgrade the employability of its pass-outs, will outfit them with the necessary authority abilities for forthcoming modern needs and react to proceeding with proficient prerequisites. Crossing over the holes will support the Industry, Government and Society in various ways. The business will get profited as it will promptly prepare the business ability. Government will get profited as industry arranged instruction will assist with diminishing the un-employability and improve the salary levels of the individuals from qualified age gathering.



About 10 years back India's developing populace was an enormous reason for worry for the nation. No one understood in those days that the populace could end up being the nation's greatest resource today. With a size of more than 500 million or more workforce, India is bound to turn into a pioneer in the worldwide abilities based economy.

An ongoing report by 'Man Power' proposes that 67 percent of Indian bosses are attempting to discover skilled labor to meet their prerequisites and the explanation behind this is the absence of employability skills, such as communication, introduction, relational abilities, group working, and so forth. Presenting employability aptitudes in our instruction framework, upgrading the understudies to create work abilities and better planning them for the activity the market is a crucial area that needs quick consideration.

According to a data, 75% of India's population falls in the working age gathering of 15 to 59 years. By 2050, the country's evaluated working populace is said to develop more than 1 billion in numbers which implies more employment seekers and a greater business emergency. Presently, we have just 10 percent of the young populace of India that have legitimate professional preparing. It is subsequently important to change over the current open doors into a reality for adolescents by tending to their needs at a monstrous scale across fields including designing, innovation, engineering, drug store, the board, applied expressions and specialties. This could be accomplished through professional training. These courses are intended to give double favorable position of training and expertise advancement which will better vocation possibilities for these people.

It would not be right on the off chance that one proposed that's kill based education alone is necessary as contrasted with normal training. Any aptitudes would need to be instructed through a medium which would normally incorporate information regarding the matter and supplement it. Both together would profit the general advancement of the understudies to support themselves later on.

Are we upgrading?

It is anyway appropriate to take note of that with the dispatch of the Make-in-India activity, professional training has been pushed to the front line. The administration has been making a decent attempt to push these courses however have neglected to discover takers for them. Getting private firms to draw in professional education as a piece of CSR could be an answer for the legislature to connect with individuals trying to advance professional education. This should be possible by giving private players charge concessions and money related guide. Undergraduates would profit by these preparation programs as experts from the business would have the option



to prepare and shape them as per the worldwide patterns. Organizations would likewise have the option to enlist potential jobseekers straightforwardly from these projects.

India has consistently been known for creating abundance number of architects and specialists, this is a direct result of the bogus suspicions individuals hold as these are lucrative professions. Pride is something that has consistently been related with Indian families with regards to picking a course, peer-weight and absence of mindfulness has also influenced the young people in the nation.

The general public needs to concur that skill-based education is certainly not a decision any longer yet a need that could answer India's joblessness emergency. Very few know that organizations are presently searching for up-and-comers who know their job rather than the ones who are looking for a vocation.

The difficulty in measuring soft skills: Vital elements in the ongoing development of the workforce include good communication skills, the ability to work in a team, confidence in your own ideas and the capability and attitude to continuously learn.

Creating a culture of learning: It is significant for students and employees to have a passion for self-development. It is unreasonable to expect education to provide individuals with all the technical and functional skills employers need as they change so rapidly. If employees are able and keen to learn, businesses are often happy to take on the burden of training.

The value of certified education and training: A lot of education (particularly vocational) is seen as too theoretical with not enough of a connection to the workplace. Employers can be suspicious of the value of a particular qualification as it may not be a good measure of whether the individual can do a job.

Inculcating Generic Skills: At the same time as business and employers are calling for more emphasis on generic skills, so too are educational providers. While this interest is stimulated partly by a desire to appeal to business and employers in an era of increasing competition and accountability, these are not the only relevant factors. There is increased awareness that well founded sets of generic skills have the potential to deliver several educational advantages to course providers whether vocational and/or educational in emphasis.

Communication: Expressing thoughts clearly, crisply articulating opinions, communicating coherent instructions, motivating others through powerful speech—these skills have always been valued in the workplace and in public life. While education has always emphasized fluent reading, correct speech, and clear writing, there is evidence that students are not mastering these



most basic skills. Additionally, there are now “global teams” that work together in business. Effective communication is essential to contribute successfully to these teams. And as technology gives rise to global work teams that span time zones, nations, and cultures, it is imperative that tomorrow’s graduates communicate clearly and effectively in a variety of languages. Linguistically and culturally *effective listening* and *effective communication* skills are essential skills for every person in the service economy.

Collaboration: Collaboration is essential in our classrooms because it is inherent in the nature of how work is accomplished in our civic and workforce lives. Collaboration has been accepted as a skill that’s essential to achieve meaningful and effective results. In the past decade, it has become increasingly clear that collaboration is not only important but necessary for students and employees, due to globalization and the rise of technology. Various scholars and authors have emphasized the importance of collaboration.

Today, creativity and innovation are key drivers in the global economy. Author Daniel Pink remarked, “The future belongs to a very different kind of person with a very different kind of mind--creators and empathizers, pattern recognizers and meaning makers. These people... will now reap society’s richest rewards and share its greatest joys.” If students leave school without knowing how to continuously create and innovate, they will be underprepared for the challenges of society and the workforce. In today’s world of global competition and task automation, innovative capacity and a creative spirit are fast becoming requirements for personal and professional success.

The Prime Minister’s National Council on Skill Development is an apex institution for policy direction and review. The Council is at the apex of a three-tier structure and would be concerned with vision setting and laying down core strategies. The Council would be assisted by the National Skill Development Coordination Board chaired by the Deputy Chairman, Planning Commission which will coordinate action for skill development both in the public and the private sector. The National Skill Development Coordination Board was set up under the chairmanship of the Deputy Chairman of The Planning Commission, on the Public Private Partnership model (PPP).



Programmes like 'Skill India' can be better taken as a special purpose vehicle where we can have a fundamental understanding of skill based education. The main goal is to create opportunities, space and scope for the development of the talents of the Indian youth and to develop more of those sectors which have already been put under skill development for the last so many years and also to identify new sectors for skill development. The new programme aims at providing training and skill development to 500 million youth of our country by 2020, covering each and every village. Various schemes are also proposed to achieve this objective.

In the light of above principles, the government has specified the features of 'Skill India':

- The emphasis is to skill the youths in such a way so that they get employment and also improve entrepreneurship.
- Provides training, support and guidance for all occupations that were of traditional type like carpenters, cobblers, welders, blacksmiths, masons, nurses, tailors, weavers etc.
- More emphasis will be given on new areas like real estate, construction, transportation, textile, gem industry, jewellery designing, banking, tourism and various other sectors, where skill development is inadequate or nil.
- The training programmes would be on the lines of international level so that the youths of our country can not only meet the domestic demands but also of other countries like the US, Japan, China, Germany, Russia and those in the West Asia.

There are many other data and their interpretation that give us a perfect idea of meeting the needs of employers today in the country and outside. Higher education institutions can primarily be the only power house to generate the required workforce and they can be trusted by the industrialists and producers at larger scale. It is the golden time and opportunity both for the HEIs as well as youths in the country to get job ready and add a handful of share to global economy.

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WOMEN IN INDIA AND ISRAEL : PAST, PRESENT AND FUTURE

(Proceeding)



Editor in Chief
JYOTI NISWADE

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SOCIAL COMMUNITY AND CODE OF COMMUNICATION IN AMITAV GHOSH'S IBIS TRILOGY

▪ **Ms. Anita Tirpude**

Abstract

Globalization has brought the different communities together and compelled us to understand each other language to communicate. Nowadays multilingual communication is created due to migration, transnational relation, multilingual literature etc. This has developed proficiencies in varied languages among people belonging to different nations. This form of multilingual communication is from the pre - colonial period which reflect homogeneity and multilingualism. In the diaspora literature, we see author using multilingual communication to break the barrier within between people of different nations and communities. Amitav Ghosh is one such Indian writers writing in English. Ibis trilogy is an epic, where we see different people coming together on the ship Ibis either by force or voluntarily to become indentured labour for the sugar plantation by imperial for their mercenary purpose. Here, the indentured labour are from different places all over the globe interact with each other. In this journey, they becomes 'Ship Siblings' i.e Jahag Bhai. Amitav Ghosh has very craftily used different languages and dialects throughout his novel which were spoken in the nineteenth century in the Northern and Eastern parts like Bihari, Bengali, Bhojpuri and also different kinds of pidgin used by other labour on the ship Ibis from different places crossing the ocean to form a new identity. He also incorporates in it's a varied form of English from British, American, Indian English and Chinese pidgin English. In this paper, I'm going to discuss about Amitav Ghosh experiments with different languages and dialects from India to China for the trade of opium which ultimately leads to First opium war in China.

Keywords: *language, Dialects, pidgin, multilingualism.*

Introduction

Language is a mode of communication among people of different communities. It is a way of expressing once culture. It is a tool which expresses the values and traditions of once community. Primarily, the

language was spoken and not written but with the invention of printing press, there developed medium of writing through which human being shared their thoughts in printed form. Language makes human being a rational animal and raises it's above the position of animals. Human being has acquired the ability to think and this is not possible without language.

“Aristotle was convinced, however, that meaning was no less an integral part of language than the sounds which bear the meaning and that language depends no less on the rational powers of man by which meanings are constructed than on the 2 physiological organs by which sounds are formed.”(Mc Richard Keon p194)

Language is social by nature and it has connected people and this helps in the development of society. Language and Society are interconnected. It is said that-

“Man’s relation with the society is so intimate and close that it is very difficult to isolate him from the social environment in which he is born, nurtured and grown to be a man.” (Mc R. M. Iver, and H.Charles p 45)

Amitav Ghosh has used different languages and dialects in his Ibis Trilogy to achieve his goal. It consists of three novels - Sea of Poppies, River of Smoke and Flood of Fire. All these three novels are historical novels belonging to the 19th century during the pre-independence era in the year 1838, which begins with the story of indentured laborers crossing the Indian Ocean to the opium war of independence fought between India- British- China. Characters are from different background. In the first novel, Sea of Poppies, we see sailors, coolies, convicts all come together on the Ibis to travel Mauritius. The novelist depicts rich languages add a new dimension to the novel. Each character uses peculiar language which is somewhat difficult to understand adds a flavor of multilingualism in the novel. In the second novel, River of Smoke, story takes a further turn where we see opium trade in China in 1830. Opium is imported to China and Chinese government is trying to stop the import of opium in China due to increase in addiction among the Chinese populace. The novel consists of multitude of stories, variety of languages used by Chinese, Indian and creole words are seen throughout the novel. In Flood of Fire, the final part of Ibis Trilogy we see in the name of free trade, British declared war against

China and there is an outbreak of first opium war and China is defeated with British claim on Hong Kong.

Thus, Ibis Trilogy is a historical novel which has multiples of themes like colonialism, migration caste system, capitalism etc. It also recreates different languages in the 19th century. Ghosh has wonderfully used language to revive the social, cultural and political setting of early colonial period.

Sea of poppies

Sea of Poppies is the first part of Ibis Trilogy, which shows author's craftsmanship. Author gives us the minute description of nineteenth century which includes Bhojpuri songs, Lascars, pidgins, Indian English languages spoken by East India Company officials, etc. The story starts with Deeti, the protagonist of the novel who lives on "outskirts of the town of Ghazipur some fifty miles east of Benaras." (SOP, p3). Deeti mentioned about the ship:

The vision of a tall-masted ship, at sail on the ocean, came to Deeti on an otherwise ordinary day, but she knew instantly that the apparition was a sign of destiny for she had never seen such a vessel before, not even in a dream: how could she have, living as she did in northern Bihar, four hundred miles from the coast? (SOP, p3)

Deeti is married to a crippled Hukum Singh who is an opium addict and in the meantime he dies. She is forced for Sati immolation as she doesn't want to give herself to her brother-in-law Chandan Singh. But she is rescued by Kalua a low caste Ox cart driver and in order to survive they become indentured labour on ship Ibis. On the ship Ibis, there are different lascars working as sailors.

The lascars in the novel were sailors who "came from places far apart, and had nothing in common, except the Indian Ocean; among them were Chinese and East Africans, Arabs and Malays, Bengalis and Goans, Tamils and Arakanese. They came in groups of ten or fifteen, each with a leader who spoke on their behalf" (Sea of Poppies, p. 13).

These lascars have been separated from their families at a very young age. They even don't know their native lands and now the sea is only world for them. The language with which they communicate is a hybrid language consisting of words, phrases which they pick from different places where they stayed and come in contact with different people for some time. Ghosh has done experiment by incorporating

the style of code mixing and code switching leading to the creation of multiple languages. *Sea of Poppies* shows a polyglot world. *Sea of Poppies* has its own dictionary to which Ghosh gave title “*The Chrestomathy*”. He has mentioned some important sources as-

T. Roebuck’s ‘*An English and Hindustanee Naval Dictionary*’, Henry Hule and A.C. Burell’s ‘*Hobson- Jobson – a Glossory of Colloquial Anglo Indian words and Phrases*’.

Zachary Reid, an American mulatto from Baltimore who worked as a carpenter on the board learnt a completely new language of lascars.

The another character, we see in the novel is Serang Ali. He speaks using varied dialects i.e he mixes languages like Hindi , English and sometimes Chinese. When Zachery inquired him about his language used: “*Afeemship*”, came the answer. “*China-side, Yankee gen’l’um allo tim tok so-fashion. Also Mich’man like Malum Zikiri.*” (16)

Through the character Serang Ali, Ghosh has used a various type of language. This shows when people using different languages forms a new dialect creating a new language which is understood by everyone creating a bond between them and also a mode of communication among themselves. Other example includes:

‘so muchee bukuk and big-big hookuming,’ ‘*Nevva mind*’, ‘*sun-sun become pukka gen’l’um*,’ ‘*resum*’ instead of ‘*rations*’, ‘*dal*’, ‘*masala*’, ‘*achar*’, ‘*bo’sun*,’ ‘*tindal*’ for ‘*bosun’s mate*,’ ‘*seacunny*’ for ‘*helmsman*’. There are few words which are not English words but they sound to be English words. There ‘*rigging*’ became ‘*ringeen*’, ‘*avast*’ became ‘*bas*,’ ‘*all’s well*’ became ‘*alzbel*’, ‘*deck*’ became ‘*tootuk*’, ‘*masts*’ were ‘*dols*’, ‘*commands*’ became ‘*Hookum*’, ‘*starboard*’ and ‘*larboard*’ became ‘*jamna*’ and ‘*dawa*’, ‘*fore*’ and ‘*aft*’ became ‘*agil*’ and ‘*peechild*.’ All these words are used in the novel by the novelist which are the examples of sea pidgin.

We read in the novel that “*lascar*” is a sailor who “*came from places that were far apart and had nothing in common, except the Indian Ocean; among them were Chinese and East Africans, Arabs and Malays, Bengalies and Goans, Tamils and Arakanese*” (SOP, p 12). Ghosh goes on and clarifies this in his comment published in *Hindustani Times*:

I came to be astonished by the number of Asian sailors who figured on the crew-lists of 19th century sailing vessels. These ‘*lascars*’ as they were called, came from every part of the Indian Ocean and the

more I read about them, the more I was intrigued by their lives. What drew them to the sea? How did they communicate, among themselves and with their officers? One day, in a library I chanced upon an early 19th century dictionary of the 'Laskari' language. Leafing through its pages, I began to wonder what it would be like for a new recruit to learn those words, to discover the nautical world — and so was born Jodu, one of the central characters in the novel. (Ghosh Confessions)

Ghosh mentions in his article on language in *Ibis* (2012) about “Malum” which comes from Arabic and it means “mate” (Ghosh Of Fanas and Forecastes 34). A word mostly used by the lascars is “hokum.” According to Roebuck’s dictionary, the meaning of “hookum” in Laskari, the lascar language, is “command” (Roebuck in Ghosh Of Fanas). From this we understand that the relationship between lascars and their malums was a master slave relationship where the master subjugate his slave, in Hegelian terms.

Then, we come across a mixture of sea slang and words and phrases of different origins, from English Creole to South Asian languages and dialects that almost faint the reader. So far as the use of Laskari language in sailing context is concerned, Ghosh explains:

Laksari was really just a language of command. For the rest, the lascars probably used, amongst themselves, a series of contact languages and pidgins, made up of elements of Swahili, Malay, and Hindusthani. To communicate with officers and white passengers they probably used variants of the Sino-Portuguese-English pidgin that came to be associated with the South China Coast. (Ghosh Of Fanas and Forecastles 56)

According to Townson N., “Pidgins are simplified languages which are developed in contact situations between people with no common language and are used for restricted, functional purposes”(Townson 93). Similarly, Romaine notes that “pidgins are the simplified languages characterized by a minimal lexicon, little or no morphology, and limited syntax” (Romaine qtd. in Townson, 94).

The example of it is : “Serang Ali wife-o hab makee die. Go topside, to hebbin. By’ mby, Serang Ali catchi nother piece wife.”(17) Or, in another sample which resembles a pidgin language: “Must too muchi shout: you go barn shoot sister. I on epiece pukka-sahib, no can catch. You take pistol in pocket, if bugger try shangai, shoot in the face” (21).

The words and phrases used by Europeans that are still unreadable employed by Europeans who lived and traded in South-Asia for many decades during the colonial period. The variety in their language is a hybrid form of English language with many Hindi, Bengali and Gujarati words. In the novel, Ghosh, like most Indian writers in the English language, cannot appear word for word in the text or give explanations which makes difficult to read without a reference book or a dictionary. These words are spelled in such a way that it highlights European accent. Singh, a reviewer of Ghosh works in this connection states that “for a reader who knows the words and their meanings, some of these passages require constant interpretation or extrapolation” (Singh Language).

Paulette, a French botanist daughter, speaks with variety of languages with Mrs Burnharm: “Where have you been chupowing (*italics mine*) yourself? I’ve been looking everywhere for you” (203). “Chupowing” is a Hindi verb “chupna” and it means “to hide” (Singh Language). In addition to it, Singh also gives words list of such kinds along with their original meaning in Hindi or Bengali. Some of them are: “Pollock-sawg” (paalak-saag) for a spinach dish, “chitty” and “dawk” (for chithi and daak, or letter and postbox), “dufter” (daftar, office), “hurrenzads” (haraamzadas, bastards), “oolter-poolter” (upside-down) (Singh Language). The last word appears as in the lines: “He turned a ship oolter-poolter in the Spratlys, which is considered a great piece of silliness amongst sailing men” (Sea of Poppies 102).

Neel is declared as convict and sent to jail, a British sergeant [sic] becomes angry “by the mere fact of being spoken to in his own language, by a native convict” that he very badly treat Neel and communicate with him “in rough Hindustani” (281). Neel even though in such a humiliated state realized that English being the colonizer language is a powerful weapon for him to be use for his own purpose.

“Sir”, he said, “can you not afford me the dignity of a reply? Or is it that you do not trust yourself to speak English?” The man’s eyes flared and Neel saw that he had nettled him, simply by virtue of addressing him in his own tongue — a thing that was evidently counted as an act of intolerable insolence in an Indian convict, a defilement of the language. . . . he decided, as in the rest of his life as a convict, he would speak English whenever possible, everywhere possible, and starting with this moment, here” (Sea of Poppies, 283).

On the board ibis, an English beats Neel for talking with Zachary in English. The Subedar slaps Neel on his face: “You think you can impress me with two words of angrezi? I’ll show you how this ingi-lis is spoken...”(Sea of Poppies, 355).

River of Smoke

River of Smoke, second part of Ibis Trilogy starts with Deeti who is presently staying in Mauritius islands, has become a leader of her community. She speaks French English Patois. She draws pictures on the walls of cave which includes scenes from her life and her family. She has established her own puja room.

Most of the characters from Sea of poppies have now arrived to Chinese Empire and thus there is shift of language to Chinese English or pidgin. The shift of merchants from India and Britain and halt at the Pearl River and they are not allowed to enter in Canton. This has done with certain purpose as the Chinese Government wants to confiscate the trade from outside. In Canton, the foreigners are not even allowed to enter in the interior, but women are even not allowed to enter in Fanqui Town which is the outpost for the merchants.

River of smoke now takes the story forward discussing about on the complexity of language, throwing light on various characters with their variable identities. In an interview, Ghosh told the interviewer working on novels involved his learning Cantonese. The story starts in Mauritius and turns to China where the main focus is the Indian community, which is occupied around the “Acha Hong” mercantile complex in Canton. The word “achha” itself is an important hybrid, Hindi word which means “all right”, a common Chinese designation for Indians and “hong” is Chinese word for a trading house. Along the way, the interaction between Mauritian Creole, Cantonese and Pidgin, and a variety of Indian languages, had a profound effect on the textual matrix English “spoke between them more than a dozen different languages”, exhibiting a linguistic diversity running counter to the “commonalities” forced on them by all being sub continentals in China (Ghosh 2011, 181).

Against a backdrop where European, Indian and East Asian languages were in conflict and co existing, the most important characters seemed to be the perfect a versatile linguistically especially Bahram, a Gujarati Parsi merchants and Neel, a former Raja and now turned convict

from Sea of Poppies. Both can communicate in non-Indian languages, Bahram is good in using Pidgin and Neel uses British English and pidgin too. In the meantime, when the characters interacted with each other, the Indian and the Chinese, most often they are using either Indian English or in a language that is not strictly spoken English, i.e., fully converted “English” - abbreviated, simplified and hybridized, artificially handled and suitable to Chinese - This converted language is called pidgin, and who, for trade and communication purposes, acted as the lingua franca, between Chinese people and the non-Chinese. The grammar used in Cantonese consists of mixed vocabulary from English, Portuguese and India.

Ghosh’s text contains the language issues which have a general and broad awareness and a sense of the complexities of multilingualism and language interaction. The Indian using languages like Neel’s Bengali, Bahram’s using Gujarati and the India language i.e Hindi but also “Tamil, Telugu and Oriya” (60) and “Marathi, Kachhi and Konkani” (292); pidgin is a hybrid language consisting of Portuguese, French, English, Chinese Cantonese and Mauritius creole.

One of the character, Bahram addresses his visitor: “So talkee me ... Sittee, sittee here. Allow, what thing wanchi? Tellmaski, chop-chop. No time have got”, and the latter replies: “Allow have ear-hear Mister Barry have come China-side with plenty, plenty big cargo. Is, is not true? Mister Barry have, no have plenty cargo, ah?”, and continues: “Galaw, Mister Barry talkee allo is inside hisheart: what-thing he thinki do with cargo? This-time cannot do-pidgin in Canton. Cannot sell. Mister Barry savvy, no-savvy ah?” (244).

Many characters in this novel are multilingual and they use their speech in amazing way. The example of it is Paulette Lambert who is brought up by her French speaking father in India. She speaks English but she is not so perfect in using English idioms and Indian English. Where she speaks, there is French interferences and it becomes more strong when she is affected by the strong emotions. When Robin writes to Paulette:

As for the query with which you ended: why, of course, you can certainly depend on me to do whatever I can to help you with your spoken English! But in the meanwhile, I do strongly urge you to exercise some care in your choice of words. There is nothing wrong of course in

speaking words of encouragement to the crew, but [...] I confess that I too would be quite astonished if a young lady of tender years were to reproach you for your spontaneity, Puggly dear, but you must not always assume that it is safe to transpose French expressions directly into English. The English equivalent of *baton-a foc*, for instance, is definitely not “foc-stick:- it is “jib-boom”.(River of Smoke)

Flood of Fire

The last novel of the trilogy, *Flood of Fire* again opens with Deeti, who got letters from painter Robin Chinnery, and a painting which represents the Canton destruction by the huge fire - still an event to take place. The story then returns to India, Bombay and Calcutta which depicts the story of two businessmen wives Mrs. Burnham, wife of Mr. Burnham, an imperialist and Mrs Bahram, an opium merchant wife in Canton. In Calcutta, Mrs. Burnham appoints Zachary on a job as a carpenter and utilizes him to fulfill her sexual lust. The Novelist shows that how the colonist dominate the lower strata of society both bodily and soul. On the other hand, Mrs Bahram in Bombay, is informed that her husband died in China and was left with a child. She is much surprised by her husband doubled life but decides to go Macau to claim for the compensation of her husband confiscated opium. Keshari, a sepoy in British army also unfolds his experiences of humiliation and exploitation in the army.

Neel after the mysterious death of Bahram, is free from the job of munshi and he works for Chinese authorities as official translators and interpreter. The year 1840, opens with a news of war against China by British in the name of free trade. This news spread in India where East India Company become well aware of the burden of financial and military supports. The third novel, is about the arrivals and reunion of all families. Zachary again sailing on the ship destined to become an independent merchant of opium in china.

The year 1841 starts with war where British overpowers China and defeats it. The new commissioner of the south province sign an agreement in which the island of Hong Kong passes to British with a promise of returning money as a compensation to the British and Indian merchant for confiscating the opium.

Conclusion

Amitav Ghosh in his *Ibis Trilogy*, has used varieties of language

DOES INCREASE IN FEMALE LITERACY WILL LEADS TO DECLINED SEX RATIO?

▪ Mr. Deena Nath Yadav

Abstract:

Compared to other countries, India is much behind with respect to education, health and gender discrimination. Despite increase in women literacy the figure of female sex ratio is falling in this country. The question arises whether increasing literacy rate, especially in urban areas, generate dilemma amongst educated women and remains the main reason of sex selective abortion. Hence, the objective of this research paper is, to correlate the literacy level of women with falling female sex ratio in India. The study was based on the survey reports of NFHS-1 (1992-93) and NFHS-2 (1998-99), in addition to NFHS-3 (2005-06). The findings of the study show that the main reason of sex selective abortion is, educated married women desire for male child(ren) for their old age security and they are using modern technology for sex selective abortion. We conclude that education is generating paradox not wisdom on women's mind and they are using their educational knowledge to acquire desire number of child (ren) and sex. Yet now, in the modern era women are not away from their cultural conflict zone because they cannot take an independent decision to give birth whether it is the matter of having pregnancy or gender. They are still under the superstitious believe about son and want to satisfy their elder family members by procreating male child.

Keywords:

Sex ratio, Women literacy level, NFHS data, Cultural Conflict Zone

Introduction

The last two Indian census data (2001 and 2011) indicate a grim demographic picture of declining sex ratios in urban areas compared to rural/ tribals areas. It is surprising that some of the progressive states like Punjab, Haryana, Delhi and Gujarat are having a distorted sex ratio. According to UN (United Nation, 1998) norms, male female ratio in the world is usually 1050 females for 1000 males. But in India, this ratio is dropping down to nearly 850 per thousand. In Human Development Survey Report (2001), India is placed in 124th position among 173 countries. It is a fact that our country is much behind compared

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Short Stories In An Age Of Globalization

Priti Singh

Abstract

The desire to tell and listen to stories is inherent in all of us. Storytelling is a fluid art form: from early oral traditions to online writing, with many stages and innovations in between, storytelling has adapted to its environment and its political, social, cultural and technological surroundings. Hence, stories have been the focal point of human consciousness for a long time. The modern short story is not an oral form anymore. It has taken on the medium of print, just like the novel, having retained some of the basic elements from the oral story. Some of the types of short stories are anecdotes, fables, flash fiction, lyrical story and vignettes. Technology has cemented the short story's popularity in this century. In the present times the short story finds itself the perfect fit for our attention spans and our mobile devices. Globalization has impacted short stories in a great way and they have become fast and snappy being uniquely adapted to the digital age. Stories have the fine ability of bringing people together. They build empathy, create context, so we can understand each other, and ourselves.

Keywords: Storytelling, short story, technology, globalization, human consciousness.

History of the short story:

The desire to tell and listen to stories is inherent in all of us. According to Somerset Maugham, the short story may have began

when the hunter narrated to his fellows, by the cavern fire, after they had eaten and drunk their fill, some fascinating incident he had heard or witnessed during the day. Curiosity might have killed the cat but the insatiable desire to know what happened next certainly aroused the imagination and skill of the teller and the suspense and patience of the listener. The oldest known tales are said to be of the Shipwrecked Sailor written on the Egyptian Papyri (about 400 BC), or the Book of Jonah from the Old Testament (350-750 BC). However, the earliest stories seem to be The Arabian Nights or The Thousand and One Nights, originally written in Arabic but made known in Europe in the 18th century in Antoine Galland's translation into French and Edward Lane's translation into English. The story tells of a king who had his wives killed successively on the morning after the consummation of their marriage, until the clever Sheherazade, the princess saved her life and that of many others, by the never-ending suspense filled tales she told him. Boccaccio's tale written between 1358 to 1378, collected in The Decameron were very popular throughout the Renaissance. These tales, relying mainly on the oral tradition, are basically discursive, focussing on a moral point. The earliest short stories in India were the famous Hitopadesh, distinct from the fables and the tales of the *Panchatantra*, which have a comparatively short story of existence. Edgar A. Poe is called the "father" of the short story because he is credited with setting up the first guidelines for the short story.

The increasing complexity of social changes have fragmented human experience which make the short story an apt vehicle for exploring the dark places of the human spirit and disembodied states of being. Short stories seem to oblige the readers too in recent times, may be because of the inability to cope with voluminous works. Moreover, the frantic pace of modern life saps out the energy from us, physically as well as emotionally. Hence in the present times short stories have again gained momentum. The beginnings of the Indian short story in English were made under the British influence. The Indian short story writer in English is, therefore, an inheritor of the British legacy

bequeathed to him by such eminent practitioners as O. Henry, John Galsworthy, Somerset Maugham, and Rudyard Kipling who themselves were greatly inspired by the French author, Maupassant. The Indian writer shares at least three of Maupassant's intrinsic traits-uninterrupted narration, preservation of curiosity, and the resulting clear picture of life.

Introduction:

Story telling is a fluid art form: from early oral traditions to online writing, with many stages and innovations in between, storytelling has adapted to its environment and its political, social, cultural and technological surroundings. Stories have been at the center of human consciousness for a long time. People tell stories, and the stories they tell, shape them for who they are (Schank 111). Pictorial histories on cave and other dwelling walls constitute the earliest forms of preserved pre-human and early – human communications. Ironically, we are not much different today from the earliest forms of pictorials on cave walls except our walls are more likely to be on Facebook than deep inside canyons or dark caves (Hulburt and Voas 111). The short story as a genre is broad and varied and is usually concerned with a single effect in only one or a few significant episodes or scenes. The form encourages economy of setting, concise narrative, and the omission of a complex plot; character is disclosed in action and dramatic encounter but is seldom fully developed. Charles May, a prominent scholar of this genre says, “the short story has been called the oldest form of verbal expression, as well as the most recent; it has been called the most natural form of verbal expression, as well as the most conventional and artificial; it has been called the literary form that most adequately reflect human reality as it is actually experienced as well as the form that reflects only an arbitrary view of human reality.” (May, 113) Because the story has been around “since our hairy grandparents set around the fire in the long winters of the stone age,” as Allende prosaically puts it, it has taken on many different forms. Valerie Shaw is right in saying that “it seems reasonable to say that a firm definition of the short story is impossible. The only

constant feature seems to be the achievement of a narrative purpose in a comparatively brief space" (21).

Types of Short Stories:

Short stories can range from a few pages to dozens of pages. Each short story type has unique components which distinguishes it from other styles. Some of the major types of short stories are:

Anecdote: Anecdote is a short and interesting story, or an amusing event, often proposed to support or demonstrate some point, and to make the audience laugh. Anecdotes can include an extensive range of tales and stories.

Fable: Fable is a succinct fictional story, in prose or verse, that features animals, legendary creatures, plants, inanimate objects, or forces of nature that are anthropomorphized (given human qualities, such as the ability to speak human language) and that illustrates or leads to a particular moral lesson. Aesop is probably the most notable author of famous examples of fable. Aesopian fables put emphasis on the social communications of human beings, and hence the morals he draws deal with realities of life. In this excerpt, Aesop gives a moral lesson that flatterers must not be trusted.

The Lyrical Short Story: The lyrical short story revolves around a recurring image or symbol with minimal focus on the plot. Though a plot line is present as the symbol is developed throughout the narrative, it is not the central focus of the story. Instead, the image, which tends to remain static throughout the story, recurs in order to give readers an understanding of the plot. Unlike plot-driven short stories that have a finite resolution, lyrical short stories have open endings. There is no definite resolution. The open ending allows for flexible readings of the central image, which gives readers the chance to reinterpret the meaning of the symbol during and after the story.

An example of a lyrical short story is Katherine Mansfield's 'The Fly,' a story about a man who tortures a fly after being

reminded of his dead son. The fly is the central image of the story and the development of the narrative revolves around it. The torturing of the fly and the man's feelings after he throws it away have multiple, open-ended interpretations. The image could symbolize the man's inability to accept death, his previous relationship with his son, or his repression of grief. No one interpretation is correct and the possibility of many meanings lends to the complexity of the lyrical short story.

Flash Fiction: Flash fiction is a short story with a strict word count, usually no longer than 2000, or even 1000 words. A piece of flash fiction is a radical concentration of plot, character, setting and exposition. The brevity forces the writer to attend to every word. Flash fiction stories start in the heat of the conflict, as there is no time to set up action. During the story, a focus on one or two main images, such as the deserted street, or a broken lamp, works collaboratively with the plot. As fast as the story begins, flash fiction stories end with a bang. Many stories of this type leave the reader at an abrupt emotional turn or an open ended resolution. An example of flash fiction is Lydia Davis' short story 'The Mice'. At just over 200 words it contains all the elements of a short story. Davis efficiently and vividly depicts the narrator and mice as characters in the setting of an untidy kitchen.

Vignettes: Vignette is a small impressionistic scene, an illustration, a descriptive passage, a short essay, a work of fiction or non - fiction focusing on one particular moment; or giving an impression about an idea, character, setting, mood, aspect, or object. We often find vignettes in creative writing, as it provides description to achieve an artistic effect. However, we also see its usage in prose and poetry. Writers use this device to explore a character, and describe the setting of a scene. Vignettes give deeper understanding of texts, as writers densely pack them with imagery and symbolism. Besides, it increases writers' language proficiency, as they use their language to its fullest by employing imagery to set a certain colour and mood. Hence, the nature of vignettes is evocative

and puts an impact on the senses of readers.

The modern short story is not an oral form anymore. It has taken on the medium of print, just like the novel, having retained some of the basic elements from the oral story. But while the medium is different, the goal of the professional short story writer is the same as that of the storyteller. The need to quickly capture the attention and to keep the story vivid is shared by both, but the strategies that are linked to the compression of the short story might be influenced more by the practical restrictions of the newspaper, than by the listening capacities of an audience. It is also generally accepted that the short story has to limit its scope to a single narrative event and effect, although it has been shown that this does not mean that the short story should be single in meaning. The compression of this event into a very limited space makes the short story an exclusive and intense genre, as it demands a coherence of all elements towards the central thesis of the story. The storyteller is typically closer to the reader than the mostly distance narrator of longer prose.

It is technology that has cemented the short story's popularity in this century. Suddenly, after years out in the cold, the short story finds itself the perfect fit for our attention spans and our mobile devices "Life is increasingly hectic and connected," argues Elizabeth Day, the novelist and co-creator of the short story salon Pindrop, which hosts public readings in locations such as the Royal Academy and Regent's Park open Air Theatre. "Many people struggle to find the time to engage with a full – length novel when they're dealing with e – mails every second of every day or having to meet deadlines or rush home or put the kids to bed. A short story offers the perfect antidote – it's the equivalent of listening to a single track of music instead of the whole album." Issy Bradley Hutchinson or Jena Hamilton- Emery thinks that short stories "engender such passion because the best leave you with something unforgettable in a few pages. They punch you in the guts, rather than take up lots of head space." Brevity, flatness of foot, unflinching

attention to detail form the core of almost every good short story. They are a whole world in miniature, like perfect small gifts. They can be transforming and transfixing like a brief encounter, but make long relationships, they never flag." A short story may not deal with a vague or general experience but is part of a particular experience, special and isolated. But there is particularity of the experience and a universality of application in theme and value. The best stories contain both. In James Joyce's words, a short story must have 'epiphany' which means self revelation or getting a sudden vision of life. This is a self awareness and a sense of profound insight, the protagonist or hero is exposed to, towards the end. It is said that a good short story is like a diamond; it has many facets. For example, it may reflect the facets of society, the characters, feelings, life etc.

Short stories are unmatched in the globalized world, being fast and snappy they are uniquely adapted to the digital age. A writer of a short story can connect with his audience in a few minutes sending out a feeling, a reflection, or a message. Globalization has impacted storytelling in a large way, bringing in its wake, stories of war, natural disasters, culture clashes, right to our doorstep by the media. Travelling has made the world a smaller place. Earlier the writer's main inspiration was at home, in the world around him. In the 20th century, for the first time that began to change, at first because of the political upheaval. Writers had to leave the country they were born in and became lifelong refugees. That turned them into a new breed: world citizens, for example, Nabokov, who was born in Russia, wrote his first novel in German and achieved fame in English with *Lolita*, a singular love story set in America. Since then, many have followed suit. Writers are no longer bound by the language they were born in or by their native environment. Storytelling may be gaining renewed importance because the internet is the ideal medium for the dissemination of stories. What is oftentimes overlooked is the fact that social networking sites like the Face book have transformed the way people can tell a story. For instance, Face book users can post a status update about what they did that day. Other users can comment on that status with related

information and as the process goes on, a story emerges. These transformations have led to a new way of thinking about how we store, share and think about storytelling (Czarnecki, 112). Hence, with internet and the digital revolution, our globalized world is speeding ahead. Through increasingly visual media, our stories are adapting accordingly. The ascent of You Tube, Flickr, Wordle, Aduma and other visualization tool serve as a vivid example of the sheer example of storytelling (Hurlburt and Voas, 112). Face book links hundreds of millions and news bubble to the surface faster than we can absorb – in part, because we no longer have time to reflect, we are so busy multi-tasking and that's where short stories come in. They are fragments of our globalized world that help us see where we stand.

A key to implementing digital storytelling is taking advantage of its interactivity – that is the fact that those listening to the story are able to listen and create instead of simply being passive recipients (Czarnecki 113). The internet has made people more open to reading story forms that are different from the novel. In recent decades, the traditional outlets for individual short stories have dwindled. But the internet has created an insatiable mouth to feed. Amazon, for instance, created its kindles Singles program in 2011 for publishing short fiction and non-fiction brief enough to be read in less than two hours. In addition, a group of smaller, internet publishers, such as Bylinder, is snapping up short fiction and gaining traction as distribution of stories. And the shorter format, according to the writers, is suitable for the small screens that people are increasingly using to read.

“The single serving quality of a short narrative is the perfect art form for the digital age”, said Dermont. “Stories are models of concision, can be read in one sitting and are infinitely downloadable and easily consumed on screens. Short stories are also perfect for the digital age”, she added, “because readers want to connect and want that connection to be intense and to move on”. That is after all, what a short story is all about.

Conclusion

A story that is heard or read still engages our imagination, but technology is actually allowing us to participate in a much older form of literature: storytelling. Digital world is a busy world – connecting stories with people. Stories bring people together. They build empathy, create context, so we can understand each other, and ourselves. Great stories are personal and universal, emotional and relevant. They build community and pass on wisdom. Stories celebrate our shared humanity. The advent of blogs, Facebook, Tumblrs and Twitter seem to validate the idea that shorter quantities of prose are more enticing to users of these technologies.

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Fostering Universal Human Values in Education

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Abstract

Values are things that have an intrinsic worth in usefulness or importance to the possessor, or principles, standards, or qualities considered worthwhile or desirable. Values are important in the sense that they serve as a guiding principle for an individual. Human values are the foundation for any viable life within society. The universal human values of Love, Truth, Peace, Right Conduct and Non – Violence, compass all the human virtues as an essential component of quality learning and teaching. At the heart of human values education is the conviction, that above all else, it is the dedication of the teachers who are willing for the sake of children to commit themselves to an ongoing self transformation.

Key Words: human values, education

“To educate a man in mind and not in morals is to educate a menace to the society” - Theodore Roosevelt

Introduction:

Values are things that have an intrinsic worth in usefulness or importance to the possessor, or principles, standards, or qualities considered worthwhile or desirable. Values are important in the sense that they serve as a guiding principle for an individual. Human values are virtues that guide a person to take into account the human element in his interaction with other human beings. There are many positive dispositions which help in creating bonds of humanity between people thus setting values for all human beings. These positive feelings create an essence of humanity and fellow feeling for each other. Human values are the foundation for any viable life within society; they build space for a drive, a movement towards one another; which leads to peace. Human values thus defined are universal: they are shared by all human beings, irrespective of their

religion, nationality, culture, and personal history.

There is a universal moral law written on the human heart. (Pope John Paul II, as cited by Moody, 82) This quote implies that Pope John Paul II would like all of humanity to recognize certain universal moral principles. History is replete with calls for universality. The most agreed upon universal value identified by many writers with only slight variations is “Do unto others as you would have them do unto you” (Kane, Maciver). Gandhi promoted self- suffering, non- violence and the search for truth as universal values. Krieger believed that love was the singular foundation principle of all ethics and morality. Darwin speculated that the desire for approval and sympathy was the primary root of morality. Contemporary psychologists view altruism as the universal and the most important survival mechanism for the human species. The UN (1948) document titled “Universal

Declaration of Human Rights" affirmed the dignity, equality and freedom (from tyranny, fear and torture) of all people.

Human values in education has its roots in 'educare', that has as its goal the transformation of students, teachers, parents and the community into members of a society who truly care about each other and the environment in which we all live. The universal human values of Love, Truth, Peace, Right Conduct and Non - Violence, compass all the human virtues as an essential component of quality learning and teaching. Values in education not only enhance academic diligence and performance but also lifts student and teacher, well -being, promotes higher thinking skills and galvanises community involvement. Value education fosters the primary goal of creating an environment in which children can bloom and flower into their own unique manifestation of human excellence. It prepares them for a lifetime of selfless service to the community. Values can't be taught they have to be caught is a common adage. To become an exemplar teacher is therefore becoming akin to a gardener. One must know one's plants, i.e. your students, as well as the soil and climate, and on the basis of this knowledge, one's "green thumb," become an improvising, loving artist. At the heart of human values education is the conviction, that above all else, it is the dedication of the teachers who are willing for the sake of children to commit themselves to an ongoing self transformation. The teachers tend to be the humble and inspiring role models of good character as well as the catalysts of change to foster a spirit of compassion, harmony, common sense and care for a better environment to prevail in educational

institutions. The role of human value education is to mould and shape the children in such a manner as to bring forth from within the innate goodness, beauty, love and wisdom that lies hidden within them like fire within wood. The teachers' role is to become a blazing log that, by its very proximity, will set all others alight to manifest the peaceful mind and open heart which is their birthright.

"It is vital that when we are educating our children's brains we do not neglect their hearts". (14th Dalai Lama).

"Values education refers to any explicit and/or implicit school based activity to promote student understanding and knowledge of values and to inculcate the skills and disposition of students so that they can enact particular values as individuals and as members of the wider community." (DEST 2003)

Universal human values is about understanding our existence, coexistence, interdependence and understanding yourself. Teaching human values in colleges helps bring change in perspectives and way of thinking.

Several writers have tried to identify core or universal values. Their lists have been generally created through informal search for recurrent themes found within major sacred books like The Bible or The Koran. Amongst the most frequently values occurring are like treating others with respect and compassion; and the virtues of truthfulness, justice, personal responsibility, self-discipline, courage and faith. Huston Smith, a renowned scholar of religions identified seven religions as the great world religions which are as follows; Judaism (the Tanakh), Christianity (the New Testament), Hinduism (the

Upanishads and The Bhagvad Gita), Islam (the Koran), Confucianism (the Analects of Confucius), Taoism (the Tao Te Ching of Lao Tzu), and Buddhism (the Dhammapada). These religious texts and secular documents were thoroughly studied and searched upon to arrive at a relevant working list of universal moral values.

The analyses yielded to four major categories and more specific values:

1. Commitment to something greater than oneself.
 - To recognize the existence of and be committed to a Supreme Being, higher principle, transcendent purpose or meaning to one's existence.
 - To seek the Truth (or truths)
 - To seek justice
2. Self respect, but with humility, self-discipline, and acceptance of personal responsibility.
 - To respect and care for oneself
 - To not exalt oneself or overindulge – to show humility and avoid gluttony, greed or other forms of selfishness or self – centeredness
 - To act in accordance with one's conscience and to accept responsibility for one's behaviour
3. Respect and caring for others
 - To recognize the connectedness between all people
 - To serve humankind and to be helpful to all individuals
 - To be caring, respectful, compassionate, tolerant and forgiving of others
 - To not hurt others (e.g. do not murder, abuse, steal from, cheat or lie to others)

4. Caring for other living things and the environment.

In the wake of a knowledge explosion by which the present-day education system has been overwhelmed, the primary goal of education for improving the quality of life has been lost sight of. In the formative years when the people should be experiencing tender care in a tension-free atmosphere, the school presses them hard to master vast content areas. The parliamentary standing committee on Human Recourse Development in its Eighty First Report on Value based Education (1999) has underlined that Truth (Satya), Righteous Conduct (Dharma), Peace (Shanti), Love (Prema), and Non-violence (Ahimsa) are the core universal values, which needed to be identified as the foundation stone on which the value based education programme can be built up.

The National Policy on Education has laid considerable emphasis on Value Education by highlighting the need to make education a forceful tool for cultivation of social and moral values. The policy has stated that in our culturally plural society education should factor universal and eternal values oriented towards the unity and integration of our people. In the present times of unprecedented changes dislocating traditional values and creating conflict between traditional and new values there is a universal concern in respect of erosion of values, promoting values and culture which fit in with the needs of the modern times. This concern is universal but is more acute for our country which has led its own distinct culture, worked view and a living value tradition. The process of developing in to a modern nation, with new social, political and economic

institutions, and with emphasis on science and technology, has thrown up many new values – challenges in all areas of our national life. It is important that we

examine these challenges and prepare our youth to face and resolve them. Universal values are also more acutely needed, in this age of globalization, than ever before.

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APOORV KNOWLEDGE

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डॉ.अविनाश दिगंबर फुलझेले

- सहयोगी प्राध्यापक व इतिहास विभागप्रमुख डॉ. आंबेडकर महाविद्यालय दीक्षाभूमी, नागपुर, (म.रा.)

सारांश – आधुनिक भारताच्या जडणघडणीत अनेकांनी सामाजिक समता निर्माण करण्याचे प्रयत्न केलेत. राजा राममोहन रॉय, महात्मा फुले, शशिधर बंडोपाध्याय, सयाजीराव गायकवाड, छत्रपती शाहू महाराज यांनी सामाजिक चळवळ जिवंत ठेवून सामाजिक क्षेत्रात भरीव कार्य केले. त्यांनी भारतीय समाज व्यवस्थेला एक नवी दिशा प्रदान केली. हीच समाज परिवर्तनाची कास डॉ. आंबेडकरांनी धरून आपल्या सामाजिक चळवळीचा पाया घातला. त्याच आधारावर त्यांनी एक विशिष्ट ध्येय, उद्देश आणि प्रामाणिक हेतू असलेली मोठी जनसामान्यांची सामाजिक चळवळ उभी केली आणि प्रचलित भारतीय समाज व्यवस्थेला हादरवून सोडले. साधारणतः 1920 पासून डॉ. आंबेडकरांनी सामाजिक कार्याला सुरुवात केली. 1924 मध्ये बहिष्कृत हितकारिणी सभेची स्थापना करून डॉ. आंबेडकरांनी संघटित चळवळीची सुरुवात केली. या संघटनेच्या माध्यमातून त्यांनी सर्वहारा वर्गाला एकत्रित करून मजबूत सामाजिक संघटन निर्माण केले. पुढे त्यांनी महाड व नाशिक येथे माणुसकीचे, समतेचे हक्क प्रस्थापित करण्यासाठी सत्याग्रह उभारले. या सत्याग्रहाने दलितांच्या मानवी प्रश्नांकडे संपूर्ण जगाचे लक्ष वेधून घेतले. डॉ. आंबेडकरांनी चालविलेली सामाजिक चळवळ ही खऱ्या अर्थाने भारतातील समाजव्यवस्थेला हादरे देणारी होती. त्यांनी सामाजिक चळवळीच्या माध्यमातून दलितात स्वाभिमान निर्माण करून त्यांना संघटित केले. आज आंबेडकरी समाज गटातटात विभागला गेला आहे. त्यामुळे या चळवळीची संघटित शक्ती क्षीण झाली आहे. त्यामुळे डॉ. आंबेडकरांनी सामाजिक चळवळीच्या माध्यमातून जी मजबूत संघटना निर्माण केली. त्याच मार्गाचा उपयोग करून नव्याने निर्माण होणाऱ्या प्रश्नावर मार्ग काढता येईल. त्यामुळे डॉ. आंबेडकरांनी चालविलेल्या सामाजिक चळवळीचा नव्याने अभ्यास करून भावी समस्यांवर निश्चितच उपाय शोधता येईल. या समस्यांवर निश्चित आणि ठोस उपायोजना म्हणजे सामाजिक ऐक्य टिकवणे आणि संघटित लढा लढून पुढच्या पिढीच्या हक्कांची तरतूद आजच करणे गरजेचे आहे. जेव्हा एक पिढी आपल्या हक्कांसाठी लढते तेव्हा त्याचा फायदा दुसऱ्या पुढच्या पिढीला मिळतो आणि जो लढतो तोच यश संपादन करतो, या धोरणाप्रमाणे आंबेडकरी चळवळीची वाटचाल करणे, ही आजची खरी गरज आहे. या जाणीवेतून आंबेडकरांनी चालविलेल्या सामाजिक चळवळीची ऐतिहासिकदृष्ट्या मांडणी या शोधनिबंधातून करण्याचा प्रयत्न केला गेला आहे.

बीज संज्ञा : सामाजिक स्थिती , बहिष्कृत हितकारिणी सभा, महाड सत्याग्रह, काळाराम मंदिर.

संशोधन पद्धती :- ऐतिहासिक संशोधन पद्धतीचा अवलंब करून उपलब्ध साहित्याचा शास्त्रीय दृष्टीने परीक्षण करून मूल्यमापन केले गेले.

गृहीत तत्त्वे :- डॉ. आंबेडकरांनी प्रथमता सामाजिक चळवळ हाती घेऊन अस्पृश्यांना संघटित केले. या संघटनेच्या बळावर त्यांनी अस्पृश्यांच्या मुक्तीचे मोठे सामाजिक लढे उभारले.

प्रस्तावना

डॉ. बाबासाहेब आंबेडकरांनी अस्पृश्य समाजातील महार जातीत असणाऱ्या भेदाभेदांवर कडाडून हल्ला चढविला होता. आपल्याच जातीअंतर्गत असणारी विषमता आधी नष्ट करण्यात डॉ. आंबेडकरांनी पुढाकार घेतला होता. डॉ. आंबेडकरांनी 1920 सालापासून आपल्या सामाजिक कार्याला सुरुवात केली. त्यासाठी त्यांनी 'बहिष्कृत हितकारिणी सभेची' स्थापना करून सामाजिक चळवळीचा प्रारंभ केला. अनेक जनआंदोलने उभी केलीत. त्या प्रत्येक जनआंदोलनांतून त्यांनी प्रस्थापित समाज व्यवस्थेचे खरे रूप दलित वर्गापुढे ठेवले. त्यामुळे त्यांना त्यांच्या अवनतीची खरी जाणीव होऊन डॉ. आंबेडकरांच्या विचारांनी अस्पृश्य समाजात परिवर्तनाचे वारे वाहू लागले. दलितांनी परंपरागत धंदे, व्यवसाय, राहणीमान, विचार यांचा त्याग केला. डॉ. आंबेडकरांनी अस्पृश्य समाजात चेतना निर्माण करून त्यांची भक्कम पायावर सामाजिक चळवळ उभी केली. सामाजिक चळवळीतून निर्माण केलेली दलितांची शक्ती नंतर डॉ. आंबेडकरांनी राजकीय चळवळीकडे वळविली. अशा प्रकारे डॉ. आंबेडकरांनी सुचविलेला प्रगतीचा मार्ग अस्पृश्य समाजाने अंगीकारला आणि खऱ्या अर्थाने समाजक्रांतीला सुरुवात झाली. तेव्हा डॉ. आंबेडकरांनी चालविलेल्या सामाजिक चळवळीचा अभ्यासपूर्ण आढावा घेतला आहे.

डॉ. आंबेडकरांची सामाजिक चळवळ

डॉ. बाबासाहेब आंबेडकरांना शिक्षण घेत असतानाच अस्पृश्यतेचे चटके बसले होते. केवळ महार समाजामध्ये जन्मास आल्यामुळे त्यांना पदोपदी अपमान झाला होता. याच कारणामुळे त्यांना संस्कृत भाषा शिकण्यास मज्जाव करण्यात आला होता.¹ जगातील दुसऱ्या कोणत्याही समाजावर झाला नसेल इतका अन्याय भारतातील या हिंदू धर्माच्या

वर्णाश्रम पद्धतीने पददलितांवर केला होता. काही सुधारणावादी हिंदूनी अस्पृश्यता निवारण करण्यात पुढाकार घेतला होता. पण हिंदू समाज सुधारकांच्या प्रयत्नांचे खरे विश्लेषण वि. स. खांडेकर यांनी सुंदर शब्दांत केले आहे. या संदर्भात ते म्हणतात की, "आमची प्रत्येक सुधारणा— लोखंडी साखळीने खांबाला बांधून ठेवलेल्या माकडासारखी स्थिती झाली आहे. हे माकड इकडे तिकडे फिरत, उड्या मारत सर्व काही करतं, पण ते सारे खांबाभोवतालच्या दहा—वीस हातांच्या जागेत त्याला करावं लागतं"² या वरून तत्कालीन सुधारणावादी कार्याची आपल्याला जाणीव होते. यावर मात करण्याकरिता डॉ. आंबेडकरांनी स्वतः सर्व सूत्रे हाती घेण्याचे ठरविले होते.

डॉ. आंबेडकर मे 1920 मध्ये नागपुरात भरलेल्या भारतीय बहिष्कृत परिषदेमध्ये सहभागी झाले होते त्यावेळी त्यांनी, "...आपण येथे जमलेले सर्व प्रतिनिधी बहिष्कृत वर्गाची उन्नती कशी होईल यादृष्टीने विचार करण्याच्या हेतूने जमलो आहोत. म्हणून आपल्या लोकांच्या उन्नतीच्या आड येणारी व्यक्ती मग ती बहिष्कृत वर्गातील असो किंवा उच्चवर्णीय हिंदूतील असो, तसेच एखादी संस्था असो पण ती आपल्या हिताविरुद्ध एखादे कृत्य करीत असेल किंवा तसेच कृत्य तिने मागे केले असेल तर त्या गोष्टीचा आपण निषेध करावा किंवा नाही,"³ असा प्रश्न उपस्थित केला होता. यावरून अस्पृश्यांच्या हिताविरुद्ध स्वकीय असो की दुसरे कोणीही असो त्याविरुद्ध संघर्ष करण्याचे डॉ. आंबेडकरांनी ठरविले होते, हे स्पष्ट होते. डॉ. आंबेडकरांनी समाज स्थितीचे अवलोकन केल्यानंतर समाजसुधारणेचे— समाज उद्धाराचे काम त्यांनी सुरू केले आणि याचा पहिला टप्पा म्हणून त्यांनी संघटन व जागृती करण्यास सुरुवात केली. या कार्याला मूर्त रूप देण्यासाठी 9 मार्च 1924 ला मुंबईच्या दामोदर

हॉलमध्ये समाजसेवकांची बैठक झाली. त्याप्रमाणे या संस्थेला बहिष्कृत हितकारीणी सभा हे नाव द्यावे असे डॉ. आंबेडकर यांनी सुचविले व ते मंजूर करण्यात आले. 20 जुलै 1924 ला 'बहिष्कृत हितकारिणी सभा' स्थापन झाली असे जाहीर केले. त्यावेळी डॉ. आंबेडकर म्हणाले होते की, '... मी अभ्यास केला आहे. मी मिळविलेल्या ज्ञानशक्तीचा उपयोग केवळ माझे कुटुंब व जात यांच्यासाठी करणार नाही. मी सर्व अस्पृश्य समाजाच्या चळवळीसाठी तिचा उपयोग करणार आहे... अस्पृश्यांची समस्या म्हणजे प्रचंड हिमालय आहे. या हिमालयाशी तक्रार करून मी माझे डोके फोडून घेणार आहे. हिमालय कोसळला नाही तरी माझे रक्तबंबाळ डोके पाहून सात कोटी अस्पृश्य लोक तो हिमालय जमीनदोस्त करण्यास एका पायावर तयार होतील व त्यासाठी प्राणार्पण करतील असा आत्मविश्वास डॉ. आंबेडकरांना होता.'⁴ त्याष्टीने त्यांनी वाटचाल केली.

दलितांचे या देशातील समाज व्यवस्थेतील स्थान, त्यांची परंपरागत विचारसरणी आणि त्यांच्या अगतिकतेला कंटाळून डॉ. आंबेडकर त्यांना उद्देशून नेहमी म्हणत असत की, ही तुमची स्थिती देवनिर्मित नसून मानवनिर्मित आहे. तुम्हाला अन्न, वस्त्र व निवारा इतरांच्या बरोबरीने मिळणे, हा तुमचा जन्मसिद्ध हक्क आहे. म्हणून स्वाभिमानपूर्ण जीवन जगण्यासाठी स्वावलंबन हाच खरा आत्मोन्नतीचा मार्ग आहे. बाबासाहेबांना हे माहित होते की, जोपर्यंत हा समाज स्वतः होवून लाचारीचे जीवन सोडणार नाही तोपर्यंत त्यांच्या सामाजिक जीवनात बदल होणार नाही. म्हणूनच डॉ. आंबेडकर आपल्या समाजास नेहमी सांगायचे की, '... रोग एकाला, औषध खायचे दुसऱ्याने, असे झाल्यास रोग्यास गुण येईल काय? यावरून ज्यांच्यावर संकट आले आहे, त्याने रडत न बसता मोठ्या धैर्याने व निर्धाराने त्या संकटास तोंड दिले पाहिजे,

त्याच्याशी मुकाबला केला पाहिजे...'⁵ असा आत्मविश्वास त्यांच्यात ते निर्माण करित होते. त्यासाठी त्यांनी दलितांना आपले गुलामगिरीची कामे आता बंद केली पाहिजेत, आपण माणसाप्रमाणे वागले पाहिजे म्हणूनच डॉ. बाबासाहेब आंबेडकर यांनी आपल्या सार्वजनिक जीवनाला सुरुवात केल्यावर इतर कार्यबरोबरच आपल्या अस्पृश्य वर्गात जागृती करण्याची आपल्या समाजात सामाजिक सुधारणा करण्याची, आपल्या अस्पृश्य समाजात स्वाभिमान निर्माण करण्याची चळवळ हाती घेतली होती. डॉ. आंबेडकरांनी आपल्या सामाजिक सुधारणा चळवळीला पुढील कार्याने प्रारंभ केला.⁶ अस्पृश्यांनी मेलेल्या जनावरांचे मृत मास खाण्याचे बंद केले पाहिजे, अस्पृश्यांनी गावातील मेलेली लहान-मोठी जनावरे ओढण्याचे काम टाकून दिले पाहिजे, अस्पृश्यांनी गावाची झाडलोट करण्याचे बंद केले पाहिजे, उष्टे-शिळे मागून खाणे बंद केले पाहिजे, अस्पृश्यांनी गावच्या मयतीची लाकडे स्मशान भूमीत टाकणे बंद केले पाहिजे, मयताचा सांगावा पोहोचविणे बंद केले पाहिजे, अस्पृश्यांनी गावात भाकरी तुकडा मागणे बंद केले पाहिजे, अस्पृश्यांनी गावात वरिष्ठांच्या घरी सणावाराला लग्न, मुंज व श्राद्ध इत्यादी समारंभप्रसंगी गावात लाकडे फोडण्याचे काम बंद केले पाहिजे, अस्पृश्यातील स्त्री-पुरुषांनी गावातील सवर्णांच्या लग्नकार्यात मिरवणुकीत बत्ती डोक्यावर धरून पुढे चालणे बंद केले पाहिजे, अस्पृश्यांनी सवर्णांच्या लग्नात राखणदार गडी म्हणून लग्नाच्या गाडी बरोबर जाणे बंद केले पाहिजे, गावच्या भंडान्याची किंवा उरुसाची जत्रेची, समारंभाची झाडलोट व लाकडे फोडण्याची कामे करू नयेत, अस्पृश्यांनी गावातील बेवारस प्रेतांची गाडी तालुक्याला नेण्याचे बंद केले पाहिजे, सरकारी अंमलदार गावकामगार यांच्या घरीदारी राबण्याचे बंद केले पाहिजे, अस्पृश्यांनी दररोज

आंघोळ करावी, कपडे स्वच्छ धुवावेत अंगावर स्वच्छ कपडे वापरून स्वच्छ पणाने राहावे. आता घाणेरडेपणाने राहू नये, मृत जनावरांचे मांस खाण्याचे बंद करावे, असा समाज सुधारणेचा उपदेश डॉ. आंबेडकर नेहमी आपल्या सभेमधून करीत असत. अस्पृश्यांच्या मनावर हजारो वर्षे गुलामीच्या परंपरेची छाप एवढी घट्ट निर्माण झाली होती की, हा त्यांच्या मनातील न्यूनगंड घालविण्याचा डॉ. आंबेडकरांचा मूळ हेतू होता. इतर माणसासारखे आपण माणूस आहोत. आपल्याला इतर माणसांसारखेच वागण्या- चालण्याचे सर्व अधिकार आहेत. याचा आपण उपभोग घेतला पाहिजे. आपला जीवन संसार सुखाचा, समाधानाचा केला पाहिजे. अस्पृश्यतेच्या गुलामगिरीचे घोंगडे आपल्या अंगावरून काढून फेकून दिले पाहिजे आणि आपण स्वतंत्र स्वाभिमानी स्वयंप्रकाशित माणूस आहोत, असे म्हणून वागले पाहिजे. याच उद्देशाने डॉ. आंबेडकरांनी अस्पृश्य समाजात स्वाभिमानाची -समाज सुधारणेची चळवळ सुरू केली होती.⁷

डॉ. बाबासाहेब आंबेडकरांनी 'सामाजिक समता संघा'च्या माध्यमातून सहभोजनाचे कार्यक्रम सुरू केले होते. त्यांना स्वावलंबन, स्वाभिमान आणि निःस्वार्थ वृत्ती या तत्वांचा अवलंब करून दलिताना जागृत करायचे होते. यासाठी विधायक कृतीकार्यक्रमाचा एक भाग म्हणून महाड सत्याग्रह हाती घेतला. या सत्याग्रहाच्या माध्यमातून पाणी पिण्याचा हक्कच बजावला नाही तर सामाजिक समानतेची प्रस्थापना केली होती. अस्पृश्यतेचे मूळ जाती व्यवस्थेत आहे, वर्णाश्रम धर्मात जातीचे मूळ आहे आणि वर्णाश्रमाचे मूळ ब्राह्मणी धर्मात आहे आणि ब्राह्मणी धर्माचे मूळ हे अधिकार लालसेत किंवा राजकीय सत्तेत आहे असे डॉ. आंबेडकरांचे म्हणणे होते.⁸ म्हणून त्यांनी ब्राह्मणी धर्मावर कडाडून हल्ला केला. मात्र डॉ.आंबेडकर एवढ्यावरच थांबले नाहीत

तर विषमतेचे प्रतिक असणारे मनुस्मृतीचे दहन त्यांनी केले. डॉ. आंबेडकरांचा हा हल्ला ब्राह्मण व्यक्तीवर नव्हता तर ब्राह्मणांच्या संकुचित जातीवादी धोरणावर होता. उलट ब्राह्मणांच्या बुद्धीचे त्यांनी नेहमी कौतुकच केले होते. डॉ. आंबेडकरांनी ब्राह्मणी वृत्तीवरच टीका केली नव्हती तर मराठा समाजाच्या वागणुकीवरही टीका केली होती. याच दृष्टिकोनातून डॉ. आंबेडकर मराठा समाजातील जातीयवादावरही विधायक टीका करताना म्हणाले होते की, 'तुम्ही लोक सदा ब्राह्मणांना नावे ठेवता, पण तुम्ही त्यांच्या सदगुणांचे अनुकरण करीत नाहीत. काळाच्या गरजेप्रमाणे ब्राह्मण आपले विचार बदलतात, ज्ञान आणि पैसा यांचा ते पाठपुरावा करतात. लक्षात ठेवा, तुम्हाला जर ब्राह्मणांशी लढायचे असेल, तर तुम्ही त्यांच्यापेक्षा अधिक बुद्धिमान झाले पाहिजे. तुम्ही एकत्र येत नाहीत, इतकेच नव्हे तर तुम्ही एकमेकात आणि महार हे मराठ्यांपेक्षा कनिष्ठ आहोत, ही ब्राह्मणांनी दिलेली विषारी गोळी तुम्ही चघळत बसता.'⁹ यावरून डॉ. आंबेडकरांनी सर्व जातींचा सामाजिकदृष्ट्या बारकाईने अभ्यास केला होता हे दिसून येते.

बाबासाहेबांना नवा माणूस निर्माण करावयाचा होता. त्यांना नवा समाज उभा करायचा होता. त्यांना रूढीच्या- परंपरेच्या- गुलामगिरीच्या बेड्यांमधून अस्पृश्य समाजाला मुक्त करावयाचे होते. बाबासाहेबांचा हा सुधारण्याचा मार्ग म्हणजे गुलामी जीवनाविरुद्ध बंड होते.¹⁰ अस्पृश्यतेविरुद्ध हा त्यांचा लढा होता. अस्पृश्यतेच्या उच्चाटनाचा, निर्मूलनाचा हा त्यांचा मार्ग होता. म्हणूनच त्यांनी आपल्या वर्गाला माणुसकीचे हक्क प्रस्थापित करण्यासाठी संघटित लढ्याला सामोरे जायला सांगितले. त्यानुसार मार्च 1930 मध्ये काळाराम मंदिर प्रवेश सत्याग्रह सुरू केला. या सत्याग्रहाच्या दरम्यान एकदा कलेक्टर गार्डन यांना डॉ. आंबेडकर म्हणाले होते की, '...आमचा

हा सत्याग्रह मानवी हक्क प्रस्थापित करण्यासाठी आहे. हा सत्याग्रह आम्ही अतिशय शांततेने करू. आमच्या शांततामय मार्गापासून आम्ही तसूभरही ढळणार नाही. मात्र रामाच्या मंदिराचे दरवाजे बंद आहेत, तोपर्यंत आम्ही या मंदिराच्या चारही दरवाजावर रात्रंदिवस धरणे धरून बसू. मंदिराचे दरवाजे खुले होता सत्याग्रही रामाच्या मंदिरात प्रवेश करून आपला माणुसकीचा पवित्र हक्क माणूस म्हणून बजावतील आणि त्याच हेतूने आम्ही हा सत्याग्रह करित आहोत...'¹¹ असे स्पष्ट केले होते. यावरून हा सत्याग्रह माणुसकीचे हक्क बजाविण्यासाठी व सामाजिक समता प्रस्थापित करण्याचा होता हे दिसून येते.

डॉ. आंबेडकरांनी उभारलेल्या सामाजिक चळवळीचा केंद्रबिंदू हे दलितांचे शिक्षण होते. त्यांना शिक्षणाची संधीच मिळाली नसल्याने त्यांचा सामाजिक दर्जा घसरला होता. दलित समाजात शिक्षणाचा प्रचार व प्रसार झाला पाहिजे त्यासाठी डॉ. आंबेडकरांनी प्रयत्न चालविले होते. त्यावेळी उच्च शिक्षण हे वरिष्ठ जातीपुरतेच मर्यादित होते. तेव्हा दलितांच्या सर्व सामाजिक दुःखावर शिक्षण हेच औषध आहे,¹² असे बाबासाहेबांचे स्पष्ट मत होते. म्हणून त्यांनी उच्च शिक्षण प्रसारावर जास्त लक्ष दिले होते. त्याचबरोबर जातीभेदांचे समूह उच्चाटन करण्याचे कार्य करण्यास प्रेरणा मिळण्याच्या दृष्टीने डॉ. बाबासाहेब आंबेडकर आणि सविता कबीर यांचा विवाह निःसंशय स्फूर्तिदायक आणि उद्बोधक आहे.¹³ देशात सामाजिक एकता निर्माण करायची असेल तर आंतरजातीय विवाह हा प्रभावी उपाय त्यांनी सांगितला होता. एकंदरीत डॉ. आंबेडकरांना समानतेवर आधारित समाजरचना उभी करावयाची होती. हेच त्यांच्या सामाजिक चळवळीचे ध्येय होते.

मूल्यांकन

- डॉ. आंबेडकरांनी समाजस्थितीचे अवलोकन केल्यानंतर समाज सुधारणेचे, समाज उद्धाराचे काम सुरु केले. त्याचा पहिला टप्पा म्हणून त्यांनी संघटन व जागृती करण्यास सुरुवात केली. याकामी त्यांना त्यांचा समवयस्क अनुयायीचा अतोनात उपयोग झाला. दलित समाजाला त्यांनी, ' तूही माणूस आहेस माणुसकीचे हक्क तुला मिळालेच पाहिजेत' असा कानमंत्र दिला होता. त्यांच्या गुलामगिरीची त्यांना जाणीव करून दिली. त्यांचा स्वाभिमान जागृत केला. निद्रावस्थेत असलेल्या या समाजाला खळबळून जागे केले. वेळोवेळी सभांतून त्यांनी संघटित होण्याबद्दल संदेश देऊन हिंदूधर्माच्या ग्रंथांवर टीका केली. अस्पृश्य हा काही झाले तरी माणूस आहे, माणुसकीच्या सर्व हक्कावर उच्चवर्णीयाइतकाच त्याचाही अधिकार आहे व त्या हक्कांसाठी झगडणे हे त्याचे न्याय पवित्र कर्तव्य आहे. ही जाणीव प्रथम डॉ. आंबेडकर यांनी अस्पृश्य वर्गात उत्पन्न केली. ही जाणीव म्हणजे खरोखर जिवंतपणा. डॉ. आंबेडकरांनी त्यांच्या सामाजिक चळवळीतून तो निर्माण केला होता. या माध्यमातून त्यांनी मोठे संघटन निर्माण करून दलितांना संघटित करून त्यांच्या प्रगतीचा मार्ग विस्तृत केला. त्यांना सन्मानाने जीवन जगण्यास समर्थ पायावर उभे केले. हे डॉ. आंबेडकरांच्या सामाजिक चळवळीचे फलित आहे. तेव्हा त्यांच्या सामाजिक चळवळीच्या स्वरूपानुसार वाटचाल केली तर आजचे नव्याने निर्माण झालेले प्रश्न सोडविण्यास निश्चित उपयोग होईल यात शंका नाही.

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मागासवर्गीयांची शैक्षणिक प्रगती : महात्मा फुलेचा दृष्टीकोन

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डॉ. आंबेडकर महाविद्यालय दीक्षाभूमी, नागपुर

सारांश :-

आधुनिक भारताच्या इतिहासात महात्मा फुले शिक्षण विषयक कार्यासाठी विशेष ओळखले जातात. त्यांनी दलित, शोषित व स्त्री वर्गाला शिक्षणाचा मार्ग दाखवून त्यांच्या प्रगतीची दारे खुली केली. भारतीय समाज व्यवस्था ब्राह्मणी वर्गाच्या वर्चस्वाखाली नतमस्तक व ब्रिटिश सत्ता उत्रतावस्थेत असतांना महात्मा फुल्यांनी शिक्षण विषयक घेतलेली भूमिका अतिशय महत्त्वाची होती. त्यांची आर्थिक परिस्थिती बेताची असतांनाही त्यांनी दलितांच्या शिक्षणासाठी पैसा उभा करून त्यांच्यासाठी खाजगी शाळा उभ्या केल्या. त्यासाठी त्यांनी ब्रिटीशांची ही मदत घेतली पण वेळ पडली तिथे त्यांच्या धोरणावर कडाडून टीका सुद्धा केली. त्यांनी आयुष्यभर न थकता या कामासाठी कष्ट घेतले. तत्कालीन समाज व्यवस्थेत उच्च म्हणविणाऱ्या पांढरपेशा वर्गाने शिक्षण घ्यावे आणि मागासलेल्या वर्गाने कनिष्ठ दर्जाची कामे करावी हा मानवधर्म मानल्या जात होता. ब्राह्मणी संस्काराची तशी शिकवण त्यांच्या मनावर बिंबवली गेली होती. अशा रितीने गुलामगिरीत खिंतपत पडलेल्या समाजाला खऱ्या माणुसकीच्या उत्क्रांतीची शिकवण निर्भयपणे देण्याचे महान कार्य महात्मा ज्योतिबा फुले यांनी केले. ज्यांनी कधी शाळा बघितली नव्हती त्यांच्यासाठी त्यांनी शाळा काढून त्यांना माणुसकीत आणण्याचा यशस्वी प्रयत्न केला. त्यांच्या या कार्याला समस्त दलित पिढी शतदा नमन करते किंबहुना त्यांना आपल्या प्रगतीचा खरा नायक मानते. मात्र आज शिक्षणाचे खाजगीकरण झाल्याने त्यातून नव्या समस्या निर्माण झालेल्या आहेत. प्रगतीचे नवे चित्र उभे केले जात आहे, या आभासी चित्रामुळे पुन्हा दलित, आदिवासी समाज या शिक्षणापासून दूर लोटल्या जात असल्याची चिन्हे दिसू

लागली आहे. या अनुषंगाने म. फुल्यांच्या शैक्षणिक कार्याची प्रकर्षाने जाणीव होते. तेव्हा त्यांच्या शिक्षणविषयक कार्याचा ऐतिहासिक आढावा या शोधनिबंधात घेतला आहे.

कि बर्ड :- अस्पृश्य, शिक्षण, दलित व मागासलेले, शाळा, स्त्री.

संशोधन पद्धती :- ऐतिहासिक संशोधन पद्धतीचा अवलंब करून उपलब्ध साहित्याचा शास्त्रीय दृष्टीने परिक्षण करून मूल्यमापन केले गेले.

गृहीत तत्त्वे :- महात्मा ज्योतिबा फुल्यांनी दलितांच्या समस्या सोडविण्याचा व त्यांना जागरूक करण्याचा प्रयत्न केला.

प्रस्तावना :-

वैदिक काळापासूनच शिक्षणावर एका विशिष्ट वर्गाची मक्तेदारी निर्माण झाली होती. या वर्गाने हे शिक्षण तळागाळातील लोकांपर्यंत पोहचू दिले नाही. त्यामुळे देशातील दलित, आदिवासी, स्त्री, मागासलेले लोक असा मोठा वर्ग शिक्षणापासून हजारो वर्षांपासून वंचित राहिल्याने त्यांच्या प्रगतीची दारे बंद झाली होती. सर्वसाधारण ब्रिटिश आगमनापर्यंत ही परिस्थिती कायम होती. म. फुल्यांनी या कार्यासाठी स्वतः पुढाकार घेऊन दलित, स्त्री वर्गासाठी शाळा उघडल्या. या कामात ब्रिटिशांनाही सहकार्य करण्यास त्यांनी भाग पाडले. त्यांनी या कामासाठी आपले आयुष्य खर्ची घातले. आज दलितांची जी काही शैक्षणिक प्रगती दिसत आहे त्याचा पाया हा फुल्यांनी घातला होता. त्यांनी जो शिक्षण रूपी प्रगतीचा मार्ग दाखविला होता तो आजही तितकाच प्रभावी आहे. तेव्हा त्यांच्या शैक्षणिक विचारांचा व कार्याचा आढावा या लेखात घेण्याचा प्रयत्न केला आहे.

भारतात ब्रिटिश सरकारचे १८१३ च्या सनदी कायद्याने शिक्षणाकरिता एक लाख रुपयाची तरतूद केली होती. येथूनच शिक्षण देण्याच्या उद्देशाने पहिले पाऊल ब्रिटिशांनी टाकले होते. कालांतराने या निधीत वाढ होत गेली. या संदर्भात म. फुले म्हणतात की, आज पर्यंत कोट्यावधी रुपये शिक्षणावर खर्च केले मात्र, त्यातून अस्पृश्य समाजाचा मान वाढेल अशा विद्वान लोकांचा भरणा झाल्याचे दिसत नाही. इतकेच नाही तर महार, मांग आणि चांभार यापैकी कोणी एकही शिकलेला कामगार आढळत नाही. त्यांच्यात एम.ए. अथवा बी.ए. शोधूनही सापडत नाही. हा सरकारच्या शिक्षण धोरणावर लागलेला मोठा काळा **Shri Arth** असे सरकारच्या धोरणावर फुले टीका करतात. फुल्यांनी केलेली टीका योग्य होती हे १८८१-१८८२ च्या शिक्षण

खात्याच्या अहवालावरून स्पष्ट होते. माध्यमिक शाळेत किंवा महाविद्यालयात एकही महार किंवा मांगाचा मुलगा संपूर्ण मुंबई इलाख्यात नव्हता.^१ हे या अहवालावरून दिसून येते. त्यावेळी शिक्षण खात्यात एवढी अव्यवस्था फुल्यांना दिसली होती की, जर शाळा खात्यातील अव्यवस्थेवर काही लिहायचे झाल्यास त्यावर एक स्वतंत्र ग्रंथ तयार होईल,^२ असे फुले म्हणतात. सुरुवातीला ब्रिटिशांनी देशातील उच्च वर्गात शिक्षणाचा प्रचार व प्रसार केला. या संदर्भात फुले म्हणतात की, '...वरिष्ठ वर्गीयांच्या शिक्षणास उत्तेजन देण्यात सरकारचा असा हेतू दिसतो की, त्यांच्यातून जे विद्वान शिकून तयार होतील ते घनाची अपेक्षा न करता अल्पावधीतच शिक्षण प्रसारात वाहून घेतील अशी सरकारची धारणा होती. आपण जर वरिष्ठ वर्गात ज्ञानार्जनाची प्रेरणा उत्पन्न केली तर त्यांची व्यक्तिगत नैतिक पातळी उंचावेल, त्यांच्यात ब्रिटिश सरकारविषयी प्रेम, आदराची भावना फार मोठ्या प्रमाणात वाढीस लागेल आणि स्वतःला लाभलेले बुद्धिमत्तेचे वरदान आपल्या देश बांधवांमध्ये फैलावेल...' अशी अपेक्षा ब्रिटिशांची होती. परंतु वरिष्ठ वर्ग अतिशूद्र वर्गाला शिकविण्याच्या विरुद्ध होता. तरी ब्रिटिश सरकार गप्प का बसले, या संदर्भत म. फुले म्हणतात की, '...कंपनी सरकारला ब्राह्मणांची मर्जी सांभाळायची होती. कारण त्यांच्या मदती शिवाय येथे राज्य करणे शक्य नाही, हे ब्रिटिशांनी ओळखले होते.'^३ शिक्षण हे समाज सुधारणांचे मूळ आहे. सत्याचे दर्शन घडविणारे ते महान साधन आहे अशी फुल्यांची धारणा होती. म्हणूनच ते शिक्षण विषयक झिरपण्याच्या सिद्धांताला कडाडून विरोध करतात. याबाबत ते म्हणतात की, '...शिक्षण वरून खाली झिरपत जाणे केवळ अशक्य आहे. शिक्षणाचा प्रसार व्हायचाच असेल तर तो खालून वर झाला पाहिजे, असे ते निर्भयपणे सांगतात.'^४ असे सांगून ते गप्प बसत नाहीत तर त्यांनी अस्पृश्यांसाठी शाळा उघडून आपल्या विचारांना साकार केले.

म. फुल्यांनी अस्पृश्य लोकांकरिता १८५१ साली पहिली खाजगी शाळा काढली. शेकडो वर्षांनंतर अस्पृश्यांना शिक्षण देणारे म. फुले हे पहिले थोर पुरुष होते. अस्पृश्य वर्ग हजारो वर्षांपासून सामाजिक, धार्मिक गुलामगिरीच्या खोल गर्तेत पडलेले असल्याने खऱ्या अर्थाने देशाचा न्हास होत आहे ही गोष्ट म. फुल्यांनी हेरली होती. या वर्गात शिक्षणाचा प्रसार झाल्याशिवाय त्यांची अस्पृश्यता घालविली जाऊ शकत नाही. त्यांची उन्नती करावयाची असेल तर त्यांना शिक्षण देणे गरजेचे आहे, असे त्यांना नेहमी वाटत होते. त्यामुळे त्यांनी स्वतः महार

व मांग वाड्यात फिरून जिद्दीने व चिकाटीने मेहनत घेऊन शाळेसाठी मुले गोळा केली. यातून म. फुल्यांना शिक्षण प्रसाराचा उपदेश करण्याची कला चांगली गवसली होती. त्यामुळे त्यांच्या शाळेत महार-मांगाच्या मुलांची संख्या झपाट्याने वाढू लागली. तेव्हा शाळेत स्वतः एकटे शिकविणे त्यांना जड जावू लागल्याने त्यांनी एक ब्राह्मण शिक्षक पाहिला. पण त्याला इतर ब्राह्मणांनी फूस दिल्याने त्याने हे काम सोडून दिले. त्यामुळे सावित्रीबाईला या दुसऱ्या शिक्षकाचे काम करावे लागले. म. फुल्यांनी हे चालविलेले कार्य म्हणजे आपल्या धर्माला वुडविणे होय असे सनातन्यांना वाटून त्यांनी म. फुल्यांवर दोन मारकरी पाठविले होते.^५ तरी याला न डगमगता फुल्यांनी आपले कार्य सुरूच ठेवले. अतिशूद्रांच्या मुलांमुलीकरिता वेगळ्या शाळा निर्माण करण्यास युरोपियन लोकांनी फुल्यांना फार मदत केली. त्यात रेव्हॅन्यू कमिश्नर रिव्हज साहेबांनी त्यांना मोलाची मदत केली होती.^६ म. फुल्यांचे प्राथमिक शिक्षण सरकारी शाळेत व पुढील शिक्षण स्कॉटिश मिशनच्या शाळेत झाले. १८४७ मध्ये त्यांनी आपला सर्व अभ्यासक्रम पूर्ण केला. मिशनच्या शिकवणुकीचे, संस्काराचे खोल परिणाम त्यांच्या मनावर झाले होते.^७ त्यामुळे 'सत्यशोधक का ख्रिस्तशोधक?' या शिर्षकाखाली एक पुस्तिका गणपत नलावडे यांनी प्रकाशित केली होती. वरील पुस्तिकेच्या लेखकानी म. फुले हे ख्रिस्तांनी हिंदुधर्माविरुद्ध सोडलेले एक पगारी प्रचारक होते.^८ असा आरोप करून त्यांची बदनामी करण्याचा प्रयत्न केला गेला. मात्र म. फुल्यांनी न डगमगता आपले कार्य सुरूच ठेवले. अस्पृश्यांसाठी पुन्हा दुसरी शाळा १८५५ साली त्यांनी वेताळपेटेत काढली. पहिले काही दिवस या शाळांचा खर्च युरोपियन आणि हिंदू लोकांनी दिलेल्या देणग्यातून चालत होता. पुढे दक्षिणा फंडातून दरमहा ७५ रुपये मिळू लागले.^९ त्यामुळे त्यांची मोठी चिंता दूर झाली होती.

म. फुल्यांनी लिहिलेल्या सार्वजनिक सत्यधर्म या पुस्तकात शूद्र व अतिशूद्र यांच्या शिक्षणाबाबत ते म्हणतात की, '...अज्ञानी शूद्र आणि अतिशूद्रांच्या मुलास चांगले शिक्षण देण्याकरिता शाळा बांधण्याच्या कामी खर्च न करता वाई, बनारस, प्रयाग, नाशिक वगैरे ठिकाणी रामकृष्णांची देवालये बांधण्यास अतोनात खर्च करतात याला कोणी तरी नीती म्हणेल काय? शूद्रांपासून व अतिशूद्रांपासून कराचा पैसा घेत असत व तो पैसा लोकहिताकडे खर्च करण्याच्या ऐवजी देवालये बांधण्यात खर्च करीत असत...' अशी सत्यता त्यांनी मांडली आहे. तेव्हा शूद्र व अतिशूद्र जातीत शिक्षणाचा जर प्रसार करावयाचा असेल तर

त्यांच्याच जातीत शिक्षक तयार करणे फार गरजेचे आहे असे म. फुल्यांना वाटत होते. या संदर्भात बोलतांना ते म्हणतात की, '...त्या त्या जातीत शिक्षक तयार होतील तेव्हा आपआपल्या जातीचा अभिमान धरून ते आपल्या मुलांस, हातात काठी घेवून गुरांची वळती करू लागण्यापुर्वीच शिकण्याची इतकी गोडी लावतील की पुढे ती मुले मोठी झाल्यावर आपल्यातील एका मुलास गुरांच्या मागे ठेवून बाकी सर्व मुले न खेळता शिक्षका जवळ शिकण्यास कधी कमी करणार नाहीत.'¹¹ याचा अर्थ म. फुलेंनी अतिशूद्र वर्गातच शिक्षक निर्माण करावे असे सुचविले होते. ते एवढ्यावर न थांबता ब्रिटिश सरकारला याबाबत जागृत करण्याची आवश्यकता सांगून म्हणतात की, '...एका भट प्रोफेसरच्या पगारात सहा शूद्र अथवा नऊ अतिशूद्र प्रोफेसर मिळण्याची खात्री असता, आमचे सरकार या कामी भटांच्या मागे लागून आमच्या अज्ञानी बांधवांच्या कमाईचे पैसे असे बेलगाम खर्चते म्हणून त्या विषयी आपल्या सरकारस आपण जागे केले नाही तर त्याचा दोष आपल्या माथ्यावर येणार आहे.'¹²

म. फुले शूद्र व अतिशूद्रांच्या प्राथमिक शिक्षणाबरोबरच इतरांच्याही प्राथमिक शिक्षणावर अधिक भर देतांना दिसतात. १८७७ साली ज्योतीरावांनी पुण्यात स्वतःच्या संपादनाखाली दीनबंधू नावाचे साप्ताहिक सुरू करून त्यात सक्तीच्या शिक्षणाचा जोरदार प्रसार केला. म.फुले यांनी सर्व जातीच्या धर्माच्या होतकरू, दीनदुबळ्या, गरीब विद्यार्थ्यांना फी माफी, शिष्यवृत्त्या, वसतिगृह असावीत म्हणून त्यावेळेचे मि. चाटरफिल्ड व ओडरबुक यांना अनेकदा लिहून शक्य ते सहाय्य गरीब विद्यार्थ्यांना प्राप्त करून दिले.¹³ म. फुल्यांनी प्राथमिक शिक्षण सर्वांना सक्तीचे असावे यावर भर दिला होता. या संदर्भात ते म्हणतात की, '...माझे असे मत आहे की, जनतेमध्ये प्राथमिक शिक्षण काही वयोमर्यादे पर्यंत सक्तीचे करावे. निदान बारा वर्षे वयोमर्यादा पर्यंत तरी ते करावे. मराठी आणि इंग्रजी यांची आवड नसल्यामुळे मुसलमानही शिक्षणापासून दूरच राहिले आहेत. जेथे त्यांची भाषा शिकविली जाते अशा तुरळक शाळा आहेत.'¹⁴ तेव्हा देशी भाषात शिक्षण देणाऱ्या शाळांची संख्या वाढावी असे त्यांचे म्हणणे होते. मात्र देशी प्राथमिक शाळांच्या कारभाराबाबत ते अतिशय नाखूष होते. देशी प्राथमिक शाळा विषयी आपले मत व्यक्त करतांना म. फुले म्हणतात की, '...त्या शाळा खेड्यातील जुन्या वळणावरील ब्राह्मण समाजातील बहुदा टाकाऊ लोकांनी चालविलेल्या असतात. त्यांचे ज्ञान मराठी वाचन व लेखन कसेबसे समजण्या पुरते असते. त्यांना साधे त्रैशक येते. पोट भरण्याचा शेवटचा

उपाय म्हणून ते शाळा काढतात. देशी शाळा करिता शिक्षक तयार करण्याची ग्रामीण भागात काहीच सोय नाही. तेव्हा अध्यापनाचे काम पार पाडण्यास लायक असे शिक्षक असतील तरच त्यांना अनुदान द्यावे.'¹⁵ असे आवर्जून सांगण्यास फुले विस्मृत नाहीत. भारतातील शिक्षण व्यवस्थेचा अभ्यास व उपाय सुचविण्याकरिता सर विल्यम हंटर यांच्या अध्यक्षतेखाली १८८२ मध्ये हंटर आयोगाचे गठन करण्यात आले होते. या आयोगाममोर १९ ऑक्टोबर १८८२ रोजी म. फुले यांनी आपले निवेदन सादर केले होते. त्या निवेदनात त्यांनी प्राथमिक शिक्षणावरही भर दिला होता. सरकारी शाळांमधील प्राथमिक शिक्षणास समाधानकारक व योग्य आधारावर ठेवले पाहिजे. मुलांच्या भावी जीवनात प्राथमिक शिक्षण व्यावहारिक आणि उपयुक्त असणे आवश्यक आहे. शिक्षण देणाऱ्या यंत्रणा आणि शिकविण्याच्या पद्धतीची नव्याने मांडणी करणे आवश्यक आहे. या गोष्टी नमूद करून त्यांनी शिक्षकांच्या सेवेच्या अटी सुधारण्याची बाजू पेटली होती. त्यांनी प्राथमिक शिक्षकांच्या पगारात व त्यांच्या स्थितीत सुधारणांची तसेच प्रशिक्षित शिक्षकांच्या नेमणुकीची शिफारस केली होती.¹⁶ सरकारने खालच्या वर्गातील लोकांची शिक्षणाची आबाळ केली, अशी स्पष्ट भूमिका म. फुले व्यतिरिक्त दुसऱ्या कोणत्याही व्यक्तींनी आयोगा समोर मांडली नव्हती. खेड्यातील सामान्य जनतेला शिक्षण दिल्याशिवाय त्यांच्या नैतिक पातळीत सुधारणा होणार नाही असे त्यांचे स्पष्ट मत होते. त्यांनी केलेल्या शैक्षणिक कामाबाबत त्यांच्या पुण्यात मोठा दरबार भरवून सत्कार केला होता. त्यावेळी म. फुल्यांनी काढलेल्या उद्गारातून त्यांच्या साधेपणा व कर्तव्याची जाणीव व्यक्त होते. 'मी विशेष काहीच केले नाही. माझे कर्तव्य मी केले व सर्वांनी हाच कित्ता गिरवावा.'¹⁷ असा संदेश त्यावेळी त्यांनी दिला होता. एकंदर म. फुल्यांनी शूद्र व अतिशूद्रांच्या शैक्षणिक बाबतीत मोठे परिश्रम घेऊन त्यांना प्रगतीच्या वाटा मोकळ्या करून दिल्या. म.फुल्यांचे हे शैक्षणिक विचार व त्यांनी राबविलेले धोरण आजही महत्त्वपूर्ण आहे.

मुल्यांकन :-

शिक्षण फक्त उच्च म्हणविणाऱ्या वर्गाने घ्यावे आणि खालच्या दर्जाची सर्व कामे मागासलेल्या समाजाने करावी. हाच खरा मानवधर्म मानला जात होता. ब्राह्मणी संस्काराची तशी शिकवण त्यांच्या मनावर बिबवली गेली होती. अशा स्थितीत अस्पृश्यांच्या सर्वांगण उन्नतीच्या मार्गावर एकच बहुमोल औषध म्हणजे शिक्षण होय. तेव्हा सर्वप्रथम शिक्षण साध्य केले पाहिजे

याची जाणीव त्यांनी बहुजन समाजाला करून दिली. अशा रितीने गुलामगिरीत खितपत पडलेल्या अस्पृश्य बांधवांना खऱ्या उत्क्रांतीची व माणुसकीची शिक्षण निर्भयपणे देण्याचे महान कार्य महात्मा फुले यांनी केले होते. जागतिकीरणाच्या काळात शिक्षणाच्या खाजगीकरणाला अती महत्त्व दिल्या जात आहे. शिक्षणाचे बाजारीकरण केल्याने सामान्याला शिक्षण मिळणे दुरापास्त झाले आहे. शिक्षणाच्या संदर्भात जागतिक आढावा घेतला तर असे लक्षात येते की, त्यांनी आपल्या देशात शिक्षणाचे सार्वत्रिकरण केल्यानेच त्यांची प्रचंड प्रगती झाली आहे. मात्र आपण याचा कित्ता न गिरविता शिक्षणाचे खाजगीकरण केल्याने समोरच्या काळात शिक्षण हे विशिष्ट वर्गाची मक्तेदारी बनत चालली आहे. त्यामुळे देशातील मोठा वर्ग शिक्षणापासून वंचित होत आहे. मती, नीती, गती आणि वित्त याच्या नाशाला अविद्या कारणीभूत आहे असे म. फुल्यांनी प्रतिपादन केले होते. म. फुल्यांची दलितांसंदर्भातील व्यक्त झालेली शैक्षणिक नीती आजही तेवढीच दिशादर्शक आहे. तेव्हा त्यांनी सुचविलेल्या मार्गानेच देशाची खरी प्रगती होवू शकते यात शंका नाही.

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सारांश

डॉ. बाबासाहेब आंबेडकरांनी दलितांच्या मुक्तीसाठी मोठी चळवळ उभी केली होती. ही चळवळ आंबेडकरी चळवळ म्हणून आज ओळखली जाते. या चळवळीनी मोठी मोठी आंदोलने उभी करून भारतीय समाजात मोठी क्रांती घडवून आणली आहे. डॉ. आंबेडकरांनी कुशल संघटन निर्माण करून तिच्या ताकदीवर दलितांच्या मुक्तीची चळवळ सुरु केली. या चळवळीत पुरुषांबरोबर स्त्रियांनी सहभाग घेऊन आपले मोलाचे योगदान दिले. डॉ. आंबेडकरांनी महाड चवदार तळ्याचा सत्याग्रह, काळाराम मंदिर प्रवेश सत्याग्रह व पुणे कौन्सिल वरील सत्याग्रह, यासारखे मोठे सत्याग्रह उभे करून संपूर्ण देशात अस्पृश्यांच्या प्रश्नाचा लढा उभा केला होता. या आंदोलनात डॉ. आंबेडकरांनी स्त्रियांनाही सहभागी करून त्यांच्यात पुरुषांबरोबर खांद्याला खांदा लावून लढण्याची ताकद निर्माण केली. या काळात दलित वर्गात जागृतीसाठी अनेक सभा व परिषदांचे आयोजन केले गेले. स्त्रियांनी या परिषदाही गाजविल्या होत्या. पुढे त्यांच्या स्वतंत्र परिषदा भरल्या. आंबेडकरी चळवळीने शिक्षण, संघटनेचे बळ, संघर्षशीलता याचे महत्त्व विषद करून आपल्या हक्काची जाणीव स्त्रियांना करून दिली होती. स्त्री संघटन, स्त्री नेतृत्व यादृष्टीने आंबेडकरी आंदोलनातील स्त्रियांचा सहभाग आजच्या स्त्री जीवनात नव्याने निर्माण झालेल्या प्रश्नाला दिशादर्शक ठरते. या जाणीवेतून आंबेडकरी चळवळीत झालेल्या आंदोलनातील स्त्री सहभागाची ऐतिहासिकदृष्ट्या मांडणी करण्याचा प्रयत्न या शोधनिबंधातून केला गेला आहे.

कि वर्ड :- स्त्री, महाड सत्याग्रह, काळाराम मंदिर, पुणे कौन्सिल.

संशोधन पद्धती :- ऐतिहासिक संशोधन पद्धतीचा अवलंब करून उपलब्ध साहित्याचा शास्त्रीय दृष्टीने परिक्षण करून मूल्यमापन केले गेले.

गृहीत तत्त्व :- आंबेडकरी चळवळीतील आंदोलनात स्त्रियांनी सहभाग घेऊन महत्त्वपूर्ण योगदान दिले. त्यांच्या सक्रीय सहभागामुळे स्त्रियांना नवी दृष्टी प्राप्त झाली.

प्रस्तावना

हजारो वर्षे गुलामगिरीत असलेला दलित वर्ग डॉ. आंबेडकरांनी सुरु केलेल्या चळवळी मुळे जागा होवू लागला होता. डॉ. आंबेडकरांनी मोठे प्रयत्न करून दलितात जागृतीचा विस्तार पेटविला आणि पाहता पाहता त्याचे लोण संपूर्ण देशात पसरविले. त्यांना त्यांच्या हक्कासाठी कार्यप्रवण करण्याच्या हेतूने डॉ. आंबेडकरांनी अनेक समानतेचे लढे उभारले. या प्रत्येक आंदोलनात पुरुषांच्या बरोबरीने स्त्रिया सहभागी

होवून आपले योगदान या लढ्यांना दिले होते. स्त्रियांनी घरादाराची पर्वा न करता वेळ प्रसंगी तुरुंगवासही पत्करला. आंबेडकरी चळवळीत स्त्रियांनी सहभाग घेतल्यानंतर त्यांना नवी दृष्टी प्राप्त झाली. एकूणच जीवनाकडे, समाजाकडे पाहण्याची नवी दिशा त्यांना मिळाली. त्यामुळे आंबेडकरी आंदोलनातील त्यांच्या सहभागाची सुरुवातीपासूनच वाटचाल पाहणे गरजेचे आहे. यात तेव्हाच्या आंबेडकरी चळवळीतील स्त्रियांच्या सहभागाचा अभ्यासपूर्ण आढावा प्रस्तुत शोधनिबंधात घेतला आहे.

आंबेडकरी चळवळीत स्त्रियांचा सहभाग

महात्मा फुले यांनी स्त्री शिक्षणासाठी पुढाकार घेऊन स्त्री शिक्षणाचे महत्त्व दलित समाजावर अधोरेखित करण्याचा पहिला प्रयत्न केला होता. त्यामुळे महाराष्ट्रात काही प्रमाणात स्त्री शिक्षणाला चालना मिळाली. दलित स्त्रिया शिक्षण घेऊन काही प्रमाणात सामाजिक कार्यात भाग घेऊ लागल्या होत्या. दलित समाजाच्या उन्नतीकरिता नागपुरातील महार लोकांनी साधारणपणे १९०६ मध्ये 'महार सभेची' स्थापना केली होती. महार सभेच्या छापील अहवालानुसार १९१३ मध्ये विठोबा रावजी मूनपंडे हे महार सभेचे अध्यक्ष होते. पुढे १९१४ मध्ये रेव्हंड जॉर्ज फिलीप हे अध्यक्ष तर विठोबा मूनपंडे हे सेक्रेटरी होते. त्यावेळी या सभेचे एकूण ६४ सभासद होते. त्यात श्रीमती तुळसाबाई बंदसोडे ह्या एकमेव स्त्री सदस्या होत्या. १९२० मध्ये छत्रपती शाहू महाराज यांच्या अध्यक्षतेखाली बहिष्कृत वर्गाची परिषद भरली होती. या परिषदेला डॉ. बाबासाहेब आंबेडकर सुद्धा हजर होते. या परिषदेच्या तिसऱ्या दिवशी सी. बंदसोडे व कु. रुक्मिणीबाई यांनी या परिषदेत आपले निर्भोडपणे, मुलींच्या सक्तीच्या शिक्षणाची आवश्यकता असल्याचे मत मांडले होते. १ एकरंद तुरुळक प्रमाणात महाराष्ट्रात स्त्रिया सामाजिक कार्यात भाग घेऊ लागल्याचे चित्र दिसून येते.

१९२१ च्या जनगणनेनुसार महाराष्ट्रातील स्त्री शिक्षणाचा जवळचा विचार केला तर असे लक्षात येते की, स्त्रियांमध्ये शिक्षणाचे प्रमाण फारच कमी होते. अहमदनगर, पूर्व खानदेश, नाशिक, पुणे, सातारा, सोलापूर या जिल्ह्यातील महार, चांभार व मांग समाजातील एकूण स्त्रियांच्या संख्येपैकी त्यांच्या शिक्षणाचे प्रमाण लक्षात घेता असे दिसून येते की महार जातीतील एकूण स्त्री-पुरुषांची संख्या ४,३६,२८४ होती. त्यात केवळ ९२५ महार स्त्रिया शिक्षित होत्या. शिक्षणाचे प्रमाण इतकं अस्पृश्य जातीत तपासले तर खूप तफावत दिसून येत नाही. चांभार जातीची एकूण लोकसंख्या ९४,५१८ पैकी केवळ १४० स्त्रिया शिक्षित होत्या. मांग जातीची एकूण लोकसंख्या १,१४,७९५ होती त्यात २३६ स्त्रियाच शिक्षित होत्या. हीच स्थिती मध्यप्रांत व-हाडातही होती.

७८,६६१ या मांगाच्या एकूण लोकसंख्ये पैकी ३७ स्त्रिया, एकूण ११,७०,७३७ लोकसंख्या असणाऱ्या महार जातीत ५५५ स्त्रिया, १३,४४८ मेहतर जातीतील स्त्री-पुरुष संख्येपैकी केवळ २७ स्त्रिया, तर डोर जातीत शिक्षण घेतलेल्या स्त्रियांची संख्या शून्य होती. ८,८१,६७४ लोकसंख्या असणाऱ्या चांभारातील ३८६ स्त्रियाच शिक्षित होत्या.^१ यावरून आपणास स्त्रियांमधील शिक्षणाचे प्रमाण लक्षात येते. अशा परिस्थितीत डॉ. आंबेडकरांनी दलितांतील या अशिक्षित स्त्री वर्गाला चळवळीच्या एकसूत्रात बांधण्यासाठी किती परिश्रम घेतले असावे, याची कल्पना आपल्याला होते.

डॉ. बाबासाहेब आंबेडकरांनी १९२४ साली बहिष्कृत हितकारिणी सभेची स्थापना करून संघटित संघर्षाला सुरुवात केली होती. मार्च १९२७ ला या हितकारिणी सभेतर्फे महाडच्या चवदार तळघावर माणुसकीचा हक्क प्रस्थापित करण्यासाठी सत्याग्रहाचे आयोजन केले होते. १९ मार्च १९२७ ला सत्याग्रहासाठी दूरदुरून असंख्य बहिष्कृत लोक महाड येथे गोळा झाले. त्यात अनेक मुले-मुली, तरुण स्त्रिया व पौक्त बायाही सहभागी झाल्या होत्या.^२ डॉ. आंबेडकर व इतर नेते मंडळीच्या आगमनानंतर परिषदेला सुरुवात झाली. परिषदेच्या दुसऱ्या दिवशी पाणी पिण्याचा हक्क बजावण्यासाठी मोठी मिरवणूक काढण्यात आली. ही मिरवणूक चवदार तळघापर्यंत गेली होती. तिथे सर्वांनी पाणी पिऊन आपला माणुसकीचा हक्क बजावला. सर्व सत्याग्रही सभामंडपात आल्यानंतर महाड येथे मोठी दंगल घडून आली. सनातनी स्पृश्यांनी सत्याग्रहींच्या अन्नात माती टाकून सनातनी हिंदूनी पुरुष सत्याग्रहींना लाठ्यांनी मारण्यास सुरुवात केली. ते सत्याग्रही बाबकामुलांनाही मारू लागले.^३ अशा प्रकारे पहिल्याच सत्याग्रहाने सर्वांना हिंदूंच्या अमानुषतेची पुन्हा एकदा जाणीव करून दिली. या सर्व प्रकाराला न घाबरता २५, २६ डिसेंबर १९२७ ला महाडच्या दुसऱ्या परिषदेला यापेक्षा कितीतरी पटीने मोठा महिला वर्ग हजर होता. डॉ. बाबासाहेबांनी या परिषदेची तुलना १७८९ च्या फ्रेंच राज्यक्रांतीशी केली होती. डॉ. आंबेडकरांनीही या परिषदेत 'हिंदूमात्राचा जन्मसिद्ध हक्काचा जाहीरनामा' मांडला होता. श्री. सीताराम नामदेव शिवतरकर यांनी हिंदूमात्राचा जन्मसिद्ध हक्काचा जाहीरनामा परिषदेतील पहिल्या ठरावाच्या रूपाने मांडला. या ठरावाला श्रीमती गंगाबाई सावंत हिनेसुद्धा अनुमोदन दिले होते.^४ परिषदेच्या शेवटच्या दिवशी म्हणजे २७ डिसेंबर १९२७ ला रात्री खास स्त्रियांसाठी बाबासाहेबांनी भाषण केले होते. त्यावेळी स्त्रियांना उद्देशून ते म्हणाले होते की, ...आपण या सभेत आल्याबद्दल मला अत्यंत आनंद होत आहे. घर प्रपंचाच्या अडचणी न्यायप्रमाणे स्त्री व पुरुष मिळून सोडवितात, त्याप्रमाणे समाजातील अडचणी स्त्रीपुरुषांनी मिळून सोडविल्या पाहिजेत...अस्पृश्यता निवारणाचा प्रश्न केवळ पुरुषांचा नसून स्त्रियांचाही आहे... ब्राह्मणांच्या स्त्रियांत जेवढे शील आहे, तेवढेच तुमच्यातही आहे. पण तुमच्यात जितके मनोधैर्य व करारीपणा आहे तितकी ब्राह्मण स्त्रियात नाही, असे असताना ब्राह्मण स्त्रियांच्या पोटी जन्मलेले बालक का सर्वमान्य व्हावे व तुमच्या पोटी जन्मलेले बालक सर्व ठिकाणी का अवमानीले जावे, त्याला साध्या माणुसकीचा हक्क का असू नये. याचा तुम्ही कधी विचार केला आहात काय ?... जो नवरा मेलेल्या जनावराचे मास घरात आणील

त्यास तुम्ही स्पष्ट सांगा की, असला प्रकार माझ्या घरी चालणार नाही. माझी खात्री आहे की, ही गोष्ट तुम्ही मनावर घ्याल तर हा अमंगल प्रकार अत्रिवात बंद होणार...तुम्ही आपल्या मुलींनाही शिक्षण दिले पाहिजे ज्ञान आणि विद्या या गोष्टी काही पुरुषांसाठीच नाही. त्या स्त्रियांनाही आवश्यक आहे...'^५ महाडच्या क्रांती नंतर आंबेडकरी चळवळीत महिलांचा सहभाग अधिक वाढला.

डॉ. आंबेडकरांच्या नेतृत्वाखाली २ मार्च १९३० पासून श्री. काळाराम मंदिरात प्रवेश मिळण्यासाठी सत्याग्रह करण्याचे ठरले होते. तसे जाहीर सुद्धा करण्यात आले होते. ठरल्याप्रमाणे वरील दिवशी नाशिक शहरात मोठी मिरवणूक काढण्यात आली. या मिरवणुकीत ५०० स्त्रिया सहभागी झाल्या होत्या.^६ दुसऱ्या दिवशी ३ मार्च १९३० रोजी बाबासाहेबांच्या मार्गदर्शना नंतर सत्याग्रहाला सुरुवात झाली. त्यावेळी सुमारे ३५ स्त्रिया व १०० पुरुषांनी मंदिरा समोर सत्याग्रह केला होता. उत्तर दरवाजाचे नेतृत्व श्री. पतीतपावन दास यांच्याकडे सोपविले होते. या तुकडीतील ४१ जणांचा समावेश होता. त्या गंगूबाई पगारे, यमुनाबाई लोखंडे, पार्वताबाई लोखंडे, भिकुबाई व फुंदाबाई दाणी यांचा समावेश होता. तर पूर्व दरवाजावर श्री. कचर साळवे यांच्या नेतृत्वाखाली ३६ स्वयंसेवक काम करीत होते. त्यात ठकुबाई सखाराम साळवे, राधाबाई केशवराव जाधव, चंदाबाई राम थोर, द्रौपदाबाई, राधाबाई नारायण उभाडे, कोंडाबाई भाऊराव मोरे, सोमुबाई गणपत शिंदे, चिमाबाई कृष्णाजी, साळूबाई दाजीबा भालेराव या महिलांचा सहभाग होता. दक्षिण दरवाजाचे नेतृत्व पांडुरंग नाथूजी राजभोज त्यांच्याकडे होते. ते २७ स्वयंसेवकांचे नेतृत्व करीत होते. त्यात पवळा बाई संभाजी काळे, सावळाबाई, पवळाबाई रेवाजी काळे, सावळाबाई सुकाजी कदम, चिमाबाई गंगाराम काळे, कृष्णाबाई सिताराम, कानुबाई सिताराम मोरे, सईबाई दगडुजी मोरे, रमाबाई रायाजी जाधव, विठाबाई सं. गायकवाड, सरुबाई सं. गायकवाड, अहिल्याबाई भी. कर्डक, सखुबाई दगडू जाधव, लक्ष्मीबाई बाळा पगारे, बकूबाई ग. गायकवाड, साळुबाई दगडू रोडे या स्त्रियांचा समावेश होता तर पश्चिम दरवाजाचे नेतृत्व श्री. शंकरदास नारायण यांच्याकडे होते. ते २७ स्वयंसेवकांचे नेतृत्व करीत होते. यामध्ये सोहजाबाई नारायणराव जाधव, सायजाबाई संभाजी लोखंडे, रेवूबाई गणपतराव गोतारणे, सायजबाई गंगाराम भालेराव, सुंदराबाई महिपत मोरे, देऊबाई महादू, शिंपूबाई मोरे यांचा समावेश होता.^७ यावरून काळाराम मंदिर प्रवेश सत्याग्रहात महिलांनी उत्स्फूर्त सहभाग घेतला होता हे दिसून येते.

डॉ. बाबासाहेब आंबेडकरांनी स्त्रियांना जाणीवपूर्वक सामाजिक व राजकीय चळवळीत ओढले होते. कारण बहुसंख्य असा स्त्रीवर्ग मुख्य प्रगतीच्या वाटेत अग्रेसर व्हावा असे त्यांना वाटत होते. त्यामुळे त्यांनी महिला मंडळे स्थापन करण्यास स्त्रियांना नेहमी प्रोत्साहन दिले. समाजाची सुधारणा करण्याकरिता व पुरुषांच्या चळवळीला हातभार लावण्याकरिता तसेच महिलांना उच्च ध्येयाची जाणीव करून देता यावी या सर्व हेतूने मुंबई येथे २९ जानेवारी १९२८ रोजी रमाबाई आंबेडकर यांच्या अध्यक्षतेखाली महिला परिषदेचे आयोजन करण्यात आले होते.^८ ८ ते १० ऑगस्ट १९३० नागपूर येथे डॉ. आंबेडकरांच्या अध्यक्षतेखाली अखिल भारतीय दलित काँग्रेस चे पहिले अधिवेशन

घेण्यात आले होते. त्यावेळी या परिषदेत १० ऑगस्टला स्वतंत्ररित्या महिलांचे अधिवेशन घेण्यात आले. पुढे बाबासाहेब गोलमेज परिषद होऊन परत आल्यानंतर १९३२ मध्ये कामठी येथे झालेल्या परिषदेत दोनशे स्त्रिया सहभागी होत्या त्यावेळी सौ. शेवंताबाई ओगले व अंजनीबाई देशभरतार या स्त्रियांनी आपल्या भाषणातून गोलमेज परिषदेत डॉ. आंबेडकरांनी घेतलेल्या भूमिकेस व अल्पसंख्यांकांच्या करारास पाठिंबा दिला होता.^१ नागपूरला पाचपावली येथील महार शिक्षण संस्थेतर्फे नागपूर जिल्हा महिला कॉन्फरन्स पाचपावली येथे सौ. अंजनाबाई देशभरतार यांच्या अध्यक्षतेखाली १ मार्च १९३६ रोजी रविवारी दुपारी घेण्यात आली. दलित बंधू भगिनींच्या सामाजिक शैक्षणिक आर्थिक सुधारण्यासाठी आणि डॉ. बाबासाहेब आंबेडकरांच्या धर्मांतर घोषणेचे स्वागत करण्यात येऊन पूर्ण पाठिंबा दर्शविला होता.^२ अस्पृश्य महिलांची सुधारणा करण्याकरिता आणि सामाजिक, धार्मिक व आर्थिक हक्क मिळण्याकरिता अस्पृश्य महिला मंडळ स्थापन करून स्वतःच्या पायावर उभे राहून अस्पृश्य महिला समाजाची उन्नती करण्याच्या हेतूने २६ एप्रिल १९३७ रोजी नागपूर येथील इमामवाड्यात सौ. जानकीबाई फुले यांच्या अध्यक्षतेखाली कार्यक्रम घेण्यात आला होता. यावेळी अस्पृश्य महिला सुधार मंडळाची स्थापना करण्यात येऊन अध्यक्ष कु. वीरेंद्राबाई तीर्थकर, उपाध्यक्ष अंजनीबाई देशभरतार, जनरल सेक्रेटरी राधाबाई कांबळे, जाईट सेक्रेटरी शारदाबाई टेंभूणें, असिस्टंट सेक्रेटरी विमलबाई सोमकुवर, खजिनदार कु.अन्नपूर्णा मून, प्रतिनिधी बनाबाई ढेंगरे, चंद्राबाई रामटेके, सखुबाई मेश्राम, सायत्राबाई फुलझेले, भागीरथीबाई थोरत, पार्वतीबाई सोनटक्के, इत्यादी महिलांची निवड करण्यात आली होती.^३ २० जुलै १९४२ रोजी अखिल भारतीय दलित महिला परिषद घेण्यात आली होती. या परिषदेसाठी केवळ विदर्भ-मराठवाड्यातूनच नव्हे तर संपूर्ण देशातून सुमारे पंचेवीस हजार महिला या परिषदेत उपस्थित होत्या. या परिषदेच्या अध्यक्षा सुलोचनाबाई ढेंगरे, स्वागताध्यक्ष कीर्तीबाई पाटील व जनरल सेक्रेटरी इंदिराबाई पाटील होत्या.^४ एकंदर महिलांच्या ठिकठिकाणी सभा, परिषदा मधून आंबेडकरी विचार पसरविण्यात महिलांनी मोठा सहभाग घेतला होता.

डॉ. बाबासाहेब आंबेडकर व महात्मा गांधी यांच्या मध्ये १९३२ चा पुणे करार झाला होता. पुणे करारात गांधींनी दिलेल्या आश्वासनाप्रमाणे हिंदू समाजाची वागणूक नव्हती म्हणून पुणे करार रद्द करावा व अस्पृश्यांचे प्रतिनिधी विधान मंडळात अस्पृश्यांमार्फत पाठवण्याची नवीन राज्यघटनेत सोय व्हावी या हेतूने शेड्याल कास्ट फेडरेशनच्या वतीने अखिल भारतीय विधान मंडळासमोर सत्याग्रह करण्याचा निर्णय घेण्यात आला होता. त्यानुसार मुंबई प्रांतात पुणे येथे, मध्यप्रांत वन्हाड नागपूर येथे व उत्तर प्रदेशात कानपूर येथे १९४६ साली विधान मंडळासमोर सत्याग्रह करण्यात आले. त्यानुसार पुणे कौन्सिलवर सहा सत्याग्रहींचा पहिला मोर्चा कु.शांताबाई दाणी व सौ. गिताबाई गायकवाड यांच्या नेतृत्वाखाली पाठवण्यात आला.^५ नंतर त्यात हजार स्त्री-पुरुषांनी भाग घेऊन स्वतःला

अटक करून घेतली व तुरुंगवास पत्करला. टाण्याहून मनोरमाबाई तुळशीराम धोत्रे, काशीबाई जैतापकर इत्यादींनी या सत्याग्रहात गेल्या होत्या. पुणे करार विरोधी सत्याग्रहात मनोरमाबाई पंधरा दिवस तुरुंगवात गेल्या होत्या.^६ १९ जुलै १९४६ ते २७ जुलै १९४६ पर्यंत नियमितपणे पुणे कौन्सिल हॉलवर प्रचंड मोर्चा, नंतर सभा व शेवटी सत्याग्रह असा कार्यक्रम शांततेने व शिस्तीने चालला होता. या सत्याग्रहाच्या बारा दिवसात सुमारे ११५० सत्याग्रहीनी सत्याग्रह केला. त्यात १२८ महिला होत्या. सर्व सत्याग्रहींना पंधरा दिवसापासून ते तीन महिन्यांपर्यंतच्या शिक्षा झाल्या होत्या.^७

मूल्यमापन

महाडचा सत्याग्रह, काळाराम मंदिर प्रवेश सत्याग्रह, पुणे कौन्सिलवरील सत्याग्रह हे जे डॉ. आंबेडकरांनी लढे उभारले त्या सर्व लढ्यात महिलांचा सक्रिय सहभाग होता. घर संसाराची पूर्ण काळजी घेत महिला आंबेडकरी आंदोलनात ताकदीने उतरल्या. त्यांनी ही चळवळ तळागाळातील माणसापर्यंत पोहचविण्याची मोठी जबाबदारी समर्थपणे आपल्या हाती घेतली. तुरुंगात जाण्यास न घाबरता कित्येक महिलांनी हसतहसत तुरुंगवास पत्करला होता. ही शक्ती डॉ. आंबेडकरांनी त्यांच्यात निर्माण केली होती. आंबेडकरी चळवळीत महिलांनी तळागाळातील लोकांचे प्रश्न हाती घेऊन काम केले. अशा प्रकारे महिलांनी आंबेडकरी चळवळीत आपली छाप निर्माण करून तिला मजबूत पायावर उभे करण्यात मोलाचे योगदान दिले.

संदर्भ

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Study of Contribution in Dalit Movement by Tulsidas Sudhaji Shastri Sadhu

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ABSTRACT:

Dr. Babasaheb Ambedkar raised the movement for social, political, economic and religious upliftment. Nowadays, this movement is widely known as 'Ambedkarite Movement'. Many people contributed in this movement. Many people endeavored to awaken the conscience from spiritual perspective in contemporary Ambedkarite movement. Saint Tulsidas Sudhaji Shastri was one of them in Vidarbha. He played vital role in spreading Dr. Ambedkar's thoughts and ideology among Dalit community's people for awakening the spirit of untouchables in Vidarbha region. He strove hard to spread the thoughts of Dr. Ambedkar in the society though his economic condition wasn't so congenial. Many untouchable saint societies were established under his stout leadership. He endeavored to reinforce the organizational strength of Dalit Federation which was established by Dr. Ambedkar. Present research aims at the review of the historical works of Tulsidas Sudhaji Shastri from historical perspective to bring forth the local history.

Keywords: Untouchables, Spirituality, Purgation, Entrance in Temple, Education.

RESEARCH METHODOLOGY:

Historical method has been used for the present research and available data has been scientifically evaluated in the light of concerned topic.

HYPOTHESIS:

Saint Tulsidas Sudhaji Shastri played vital role in spreading Dr. Ambedkar's thoughts and ideology among Dalit community's people using spiritual perspective to awaken the spirit of untouchables in Vidarbha region.

INTRODUCTION:

Tulsidas Sadhu was born in a Mahar (untouchable) family. He had taken up the saintly way of life. As a family man, he had to struggle to meet the ends. He had two daughters and a son. The son was born in 1912. Tulsidas Sadhu had completed Char Dham, SaatPuri and 12 Jyotirling pilgrimages. He would meticulously spread the message of social, religious harmony and unity by his Bhajans and public meetings. He was struggling to deter his brethren from consuming meat of dead animals. Tulsidas Shadhu had even administered oath to the people from Mahar and Maang communities that they will not consume the meat of dead animals. The Hindu brethren from Akot, had even acknowledged and supported his intentions to eradicate untouchability.¹ He was relentlessly trying to bring in equality in the society and deter Mahars from consuming the meat of dead animals.

SUDHAJI SHASTRI SADHU

Tulsidas Sadhu, had strong beliefs in religion. He wanted to build a temple. To raise funds and other help from the society he wrote an appeal titled, 'Please take a destitute under the wings'. In a heart rendering appeal, he had said, "I have a few idols collected from various religious places. I got an idol of Lord Ram in donation. Being from the lower caste, I don't have either money or resources to build the temples to install the idols. Hence I have surrendered to you. I have faith and confidence that you will help me realize the dream of building the temple."² He travelled from town to town to raise fund for the temple. He was a well known personality in the Akot Taluka and adjoining areas due to his religious work. He would celebrate weeklong annual

programme dedicated to Saint Chokha Mela. There is an interesting story behind beginning of this annual event. According to him, Saint Debuji Maharaj pioneered untouchability irradiation and created environment conducive for ChokhaMela and other saints. He personally took up broom and cleaned the surrounding. One of the devotees of ChokhaMela donated Rs 100 for construction of Ghat and Rs 50 for the weeklong religious event in 1923. The event is going on since then, Tulsidas Sadhu says.³ He would organise the week long religious programmes at other cities and towns as well. One of such programme was organised at village Vidgaon.⁴ He tried to awaken the untouchables by his sermon. It was his dedication to the untouchables, that he was a respected personality in the region. His devotees offered him idols of Lakshman, Bharat, Maruti and Seeta Mai, Tiger Skin Mat, watch, Shell, Bell and an oil lamp at Badnera in Amravati district on 11 July 1918. The entire Saint community authorised Tulsidas Sadhu to build a temple and install these idols there.⁵ This tells about his life as a saint.

Apart from religious activities, Tulsidas Sadhu participated in various social activities. A meeting of Mahar landlords (Vatandars) from Akola district was held at Akot on Sunday, November 30, 1919 to brain storm on the strategy to counter the government move to modify the policy on *Vatan* in Berar (*Varhad*) region and to give representation to the government in this regard. He was chairman of the organising committee of the meeting.⁶ A 'Non Brahmin Akola District Council' was held at Narsing Theatre, Akot on June 3 and 4, 1920. The objective of the Council was to guide the Non Brahmin communities on their political, social, religious rights and help them become self-reliant. Non Brahmin leaders took the initiative and organised the Council at Karanjgaon. Important issues such as education, credit societies, MaharBalutas and bonded labour were discussed during the two day Council. Tulsidas Sadhu was member of the organising committee of the Council.⁷ He was active in different social

happenings in Akot area. His dedication and involvement in above mentioned issues, which were not even remotely concerned with him, shows his willingness to participate in social welfare initiatives.

A 'purification' programme was organised at village Hingni Gavandgaon in Daryapur taluka of Amravati district on June 16, 1926. Tulsidas Sadhu was present at the programme, attended by 200 people. He tabled the resolution and was instrumental in getting Wamanrao Pendharkar elected as Chairperson of the programme. He performed 'purification' as per the Hindu rituals.⁸ The untouchables who had converted to Christianity, were converted back to Hinduism and their castes. All these people had embraced Christianity due to the atrocities and inhuman treatment by upper caste Hindus. However, Tulsidas Sadhu purified and preached them, before converting back.⁹ In fact, he had launched a movement for purification. Daughter of Dharma Mang, a resident of Akot, had a daughter named Durga, aged around 10-11 years, studied in Standard II. She was denied entry into the class room because she belonged to lower caste. The Brahmin community claimed that her presence in the class deterred their daughters from going to school due to the fear of getting impure. After which, Tulsidas Sadhu wrote to the Chief Inspector and Tehsildar seeking justice to the girl. He also appealed Mr. Gavai (MLA) to look into the matter and find a way out.¹⁰ Tulsidas Sadhu did not leave a stone unturned to help Durga.

It is better that one doesn't even think of the hardships, the outcaste community and especially women, had to undergo. Tulsidas Sadhu had highlighted the difficulties faced by women from outcaste community in answering nature's call. He had written to the Chairman of Akot Municipal Committee to solve this problem. In the application he says, "Women in Group Number 3/4, Lakhnapur area of Akot face tremendous hardships in answering nature's call in public places. The passers-by not only come dangerously close

to them while walking, but also pass vulgar comments and make fun. The women are forced to go dangerously close to the lake and run a risk to lives as the water levels have risen after summer. Government is duty bound to protect the dignity of women. Hence I earnestly request that public toilets should be constructed at the earliest.”¹¹ The fact that Tulsidas Sadhu had demanded public toilets for the village as early as 1927 is a telling example of his foresight.

The Satyagraha for entry to Kala Ram Temple, Nashik began on March 2, 1930 under the leadership of Dr. Babasaheb Ambedkar. The news about the struggle had spread across length and breadth of the country. Every untouchable person had an urge from within to participate in the movement which continued for five years. Tulsidas Sadhu also wanted to participate in the struggle. But poor financial condition was the biggest hurdle. He had published a hand written circular expressing solidarity with the movement. He said, “The untouchable Hindus have started the Satyagraha at Nashik from November 5, 1931. Mr Tulidas Sadhu wants to represent Akot taluka in the struggle. The current time is really crucial for abolition of untouchability from the country. A humble request to help generously so that the said person can participate in the struggle.”¹² This appeal highlights his inner urge to participate in the struggle. Later, he participated in the movement as decided. Since then he started adding prefix ‘Satyagraha Veer’ to his name.

He had appealed the British government to nominate Dr. Babasaheb Ambedkar for Round Table Conference to represent the Dalits and raise the issues pertaining to the community. Accordingly, the British government declared the caste based restructuring and untouchables got separate constituencies. In this regard, Tulsidas Sadhu had said, “...Dr. Ambedkar is the real Messiah of seven crore untouchable citizens of the country. He has washed off the tag of being untouchable by his education in England. He has forced the government to pass the resolutions for annihilation of untouchability. Dr.

Ambedkar is our real leader. It is our duty to follow him.”¹³ Mahatma Gandhi had started fast unto death at Yerawada prison to oppose the caste based constituencies. The fast was withdrawn after the ‘Pune Pact’ was signed. In a letter written to Mahatma Gandhi, Tulsidas Sadhu had mentioned the Pune Pact, “...Lokmanya Tilak, too had visited Akot. I had met him during the visit. Considering my poor financial condition, he had awarded me Inam (Land). I had personally met many leader of the country. The reforms cannot be realised if the great leaders of this country fail to perform and it will lead to widespread discontent. Hence the resolution passed by Mahatma Gandhi and Dr. Babasaheb Ambedkar at Pune should not be altered.”¹⁴ He met Mahatma Gandhi when the later visited Akot on 18/11/1933 and handed over a report. Tulsidas Sadhu had requested that a temple should be constructed for untouchables. In the report he wrote, “We neither have God, nor do we have temple. No one is willing to accept us because we are untouchables. I was happy to know that you spent Rs 11,000 on temple for Harijans in Gujarat. I would be honoured and can boast that Mahatma has granted my wish if you could help in constructing a temple for Harijans at Akot in Varhad region.”¹⁵

He joined All India Dalit Federation after its formation. He soon became active in the functioning of the Federation. The All India Federation had organised a convention of untouchable saints from all the sub-castes in Vidarbha, at Motha Maharwada, Akola on 18.02.1934 to deliberate on social, educational, religious, political, Hindu unification and cow protection. Tulsidas Sadhu was chairman of the welcome committee of the programme.¹⁶ Dalit leader from Madras M. C. Raja and Ganesh Akkaji Gavai had taken a stand against Dr. Babasaheb Ambedkar and aligned with Hindu Mahasabha. All India Federation had organised public meetings across Maharashtra to condemn Gavai. Dr. Munje Party or Gavai Party had organised a public meeting at Anjangaon Surji, in Daryapur Taluka of Amravati district on April 22, 23 1934.

Tulsidas Sadhu organised a counter meeting demanding legal ban on Gavai or Dr. Munje to hold such meetings as they had joined hands with Congress or Independence.¹⁷The All India Dalit Federation had formed All Sect Untouchable Saint Mandalat Akola on February 19, 1934. Two *Mahants* – Head Priests were appointed on each Mandal from Nath and Das sects. Saint Tulsidas Akotkar from Das sect and Gaheti Nath Maharaj Paraskar from Nath sect were appointed as Head Priests.¹⁸ The Mandals had main mandate to work for awareness about education and preaching against bad habits and addiction, preach unity in the society to become a political power to get financial benefits, preach reconversion and prevent conversion of people to strengthen the society and the organisation.¹⁹Dalit Federation had organised a public meeting at Hinganghat in Wardha district on August 10, 1935. Dajiba Ganesh Kulsunge had chaired the meeting. A resolution to strongly condemn Gavai and use of the word Harijan was passed. Tulsidas Sadhu had delivered a speech strongly supporting the resolution.²⁰ The speech played a pivotal role in passing the resolution. Thus, he was following the path in unison with the policies of the Federation.

Dr. Ambedkar had given a call for conversion at the public meeting held at Yeola in October 1935. The entire nation had reacted to the call. It had sparked brain storming among the untouchables as to which religion to choose. The issue was centre of discussion everywhere, let it be private discussions of newspapers and publication. Tulsidas Sadhu had written an article on the issue published in Janata Patra in February 1936. He had elaborated the core issues about the conversion such as the religions and population in the villages around him. He had expressed hopes that only Muslims could work consistently as they had considerable population.²¹However, Dr. Ambedkar, through Janta Patra, had conveyed that the details of the religion to be converted to would be informed later. In all, TulssidasSudhaji Sadhu had played a vital role in

spreading the philosophy of Dr. Ambedkar to grass root level through bhajan and kirtan – devotional songs and sermons.

EVALUATION:

Tulsidas Sudhaji Shastri was a spiritual saint belonged to untouchable community. He preached Dalits on social, religious and purgation through his hymns. He criticized evil customs prevalent in untouchable community through his spiritual path and tried to refrain untouchables from it. He guided the people from religious festivals such as *Namsaptaha*. He strove hard to inculcate Dr. Ambedkar's thoughts and ideology among untouchable community's people through the path of saint. He also attempted to solve the issues of Mahar vatandar. He tried to dissuade the untouchables who were converted in another religion and started their purgation. He requested government to build toilets for untouchable women as there were no other means for them to go to the toilet. He played vital role in spreading Dr. Ambedkar's thoughts among marginalized people. He spread Ambedkarite movement in every nook of the Vidarbha though he was leading miserable life. In short, he endeavored to inculcate the ideology of Dr. Ambedkar among the untouchables by spreading Ambedkarite movement in various villages through the hymns.

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सहयोगी प्राध्यापक व इतिहास विभाग प्रमुख

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सारांश : विदर्भात आंबेडकरी चळवळीतील प्रमुख नेत्यांपैकी देवाजी खोब्रागडे एक होते. ते चंद्रपूर जिल्ह्यातील असून, त्यांनी अस्पृश्यांच्या प्रश्नासंबंधी व-हाड-विदर्भात भरीव असे कार्य केले. त्यांनी अस्पृश्य समाजात जागृती करून डॉ. आंबेडकरांचे विचार तळागाळात पोहचविण्याचे महत्त्वपूर्ण कार्य केले होते. विदर्भातील दलित चळवळीतील नेत्यांमध्ये त्यांचे नाव अग्रक्रमात येते. त्यांनी दलितांचे प्रश्न मोठ्या शिताफीने मांडून त्यांना न्याय मिळवून देण्याचा प्रयत्न केला होता. विदर्भात आंबेडकरी चळवळ रुजविण्यात त्यांनी मोलाचे परिश्रम घेतले. आयुष्यभर डॉ. आंबेडकरांचा संदेश व विचार सामान्यांपर्यंत पोहचवून भक्कम पायावर दलित संघटना घडवून आणण्यात त्यांनी मोलाचे योगदान दिले होते. या उच्च शिक्षणाविषयी बाबासाहेबांनी दिलेल्या संदेशाची अंमलबजावणी स्वतःच्या घरी केली. देवाजी हे श्रीमंत व्यक्ती असले तरी त्यांनी सामान्य कार्यकर्त्यासारखे राहून आंबेडकरी चळवळ मोठ्या निष्ठेने या प्रांतात पसरविली. ह्या त्यांच्या कार्यामुळे आंबेडकरी चळवळीत त्यांचे नाव मोठ्या सन्मानपूर्वक घेतले जाते. एकूण त्यांच्या आंबेडकरी चळवळीतील कार्याचा आढावा या संशोधनपर लेखात घेण्याचा प्रयत्न केला आहे.

शब्द संकेत :- अस्पृश्य, उच्च शिक्षण, दलित व मागासलेले, विदर्भ.

संशोधन पद्धती :- ऐतिहासिक संशोधन पद्धतीचा अवलंब करून उपलब्ध साहित्याचा शास्त्रीय दृष्टीने परिक्षण करून मूल्यमापन केले गेले.

गृहीत तत्त्वे :- देवाजी खोब्रागडे यांनी डॉ. बाबासाहेब आंबेडकरांचा विचार तळागाळात पोहचविला व दलितांना जागरूक करण्याचा प्रयत्न केला.

प्रस्तावना :- डॉ. बाबासाहेब आंबेडकर पूर्वी विदर्भात अस्पृश्यांच्या जागृतीचे काम सुरु झाले होते. डॉ. आंबेडकरांच्या समाजकारणातील प्रवेशानंतर त्यांच्या विचार व कृतिकार्यक्रमामार्गे मोठा दलित वर्ग उभा राहिला. त्यात विदर्भातील देवाजी भिवाजी खोब्रागडे यांचाही सामावेश होता. त्यांनी संपूर्ण आयुष्य डॉ. आंबेडकरांचा विचार संपूर्ण मध्यप्रांत व व-हाडात तळागाळातील समाजात पोहचविण्याचा प्रयत्न केला. डॉ. आंबेडकरांच्या संदेशानुसार स्वतःच्या पैश्याने त्यांनी आपल्या मुलाला उच्च शिक्षणासाठी परदेशात पाठविले. तेव्हा त्यांच्या संपूर्ण कार्याचा मागोवा या लेखात घेतला आहे.

सुरुवातीचे कार्य : देवाजी भिवाजी खोब्रागडे यांचा जन्म 2 जानेवारी 1899 मध्ये झाला. त्यांनी मॅट्रिकची परीक्षा उत्तीर्ण केल्यानंतर 11 वी हायर सेकंडरी मध्ये प्रवेश घेतला. पण त्यात ते नापास झाल्याने तिथून त्यांचे शिक्षण बंद झाले.¹ पुढे त्यांनी आपला मोठा भाऊ पत्रूजी सोबत मिळून बल्लारशाह येथे लाकडाचा व्यवसाय सुरु केला. त्यांनी घेतलेल्या मेहनतीमुळे त्यांचा व्यवसाय लवकरच भरभराटीला आला. हा व्यवसाय करत असतांनाच दोघाही भावांनी आपले समाजकार्यास सुरुवात केली होती. श्री देवाजी खोब्रागडे यांनी 1923 पासून आपल्या सामाजिक कार्याला सुरुवात केली होती आणि अस्पृश्यांची स्थिती सुधारण्याच्या महत्त्वाच्या कार्यास त्यांनी वाहून घेतले होते.² सुरुवातीपासूनच ते बाबासाहेबांचे एकनिष्ठ कार्यकर्ते होते. विदर्भातील मोठे पुढारी आणि 1927 पासून बाबासाहेबांच्या कार्याचे, चळवळीचे व त्यांच्या तत्त्वज्ञानाचे संबंध लोन विदर्भात त्यांनी पसरविले होते.³ अस्पृश्यांना गुलामगिरीतून मुक्त करण्याच्या डॉ. बाबासाहेबांच्या सर्व चळवळीत त्यांनी प्रामुख्याने भाग घेतला होता. त्यावेळी विदर्भातील महत्त्वपूर्ण दलितांचे पुढारी श्री. गणेश आकाजी गवई यांच्या अध्यक्षतेखाली 29, 30 मे 1927 रोजी चंद्रपूर येथे 'चांदा जिल्हा बहिष्कृत परिषद' झाली होती. या परिषदेचे स्वागताध्यक्ष श्री. पत्राजी भिवाजी खोब्रागडे होते.⁴ अशाप्रकारे हे दोघेही भाऊ तन, मन, धनाने अस्पृश्यांच्या मुक्तीच्या चळवळीत सहभागी झाले होते.

देवाजी खोब्रागडे यांनी सुरु केलेल्या समाजकार्यामुळे ते या भागात सर्व परिचित झाले होते. त्यांच्या असणाऱ्या जनसंपर्कामुळे व त्यांनी चालविलेल्या कामामुळे ते 1929 ते 1934 पर्यंत चांदा म्युनिसिपल कमिटीचे सभासद झाले होते.⁵ याकाळात त्यांनी डॉ. आंबेडकरांचे विचार दलित समाजाला माहित व्हावे म्हणून ठिकठिकाणी सभेला जावून त्यांचे विचार पसरविण्यात पुढाकार घेतला होता. अशीच एक परिषद 31 मे व 1 जून 1934 रोजी श्री. चोखामेळा चांदा तालुका परिषदेचे अधिवेशन श्री. विक्रम बुटानी शेंडे, मालगुजार यांच्या अध्यक्षतेखाली पार पडले. या परिषदेला चांदा, ब्रह्मपुरी, हिंगणघाट, आरमोरी अशा दूरदूरच्या भागातून बरीच मंडळी आली होती. या परिषदेमध्ये जवळजवळ वीस ठराव पास झाले. या ठरावात प्रामुख्याने पुणे करारास पाठिंबा, स्थानिक स्वराज्य संस्थांच्या किंवा सरकारी नोकऱ्यात अस्पृश्यांना लोकसंख्येच्या प्रमाणात नोकऱ्या मिळाव्यात,

सांजनिंक विहिरी, तळी अस्पृश्यांना खुली असावीत, मुला- मुलींच्या शिक्षणाचा प्रसार होईल अशी चळवळ उभारावी, डॉ बाबासाहेबांच्या कामगिरीस पाठिंबा, अनिष्ट रुढींचा त्याग वगैरे प्रमुख ठराव होते. हे सर्व ठराव पास झाल्यानंतर या ठरावावर देवाजी खोब्रागडेनी भाषण केले⁶ व या ठरावाचे महत्त्व उपस्थित जनतेला समजावून सांगितले.

धर्मातराच्या घोषणेस पाठींबा 1935 मध्ये डॉ. आंबेडकरांनी येवला परिषदेत धर्मातराची घोषणा केल्यावर स्पृश्य समाजाकडून त्यांचा सर्वत्र विरोध होवू लागला. तेव्हा त्यांच्या समर्थनात श्री. देवाजी खोब्रागडे यांनी सभा घेतल्या. चंद्रपूर शहरात 25 ऑक्टोबर 1936 रोजी डॉ. बाबासाहेब आंबेडकरांच्या फोटोची मोठी मिरवणूक प्रमुख रस्त्यावरून काढण्यात आली. या मिरवणुकीनंतर एक सभा घेण्यात आली. या सभेत श्री. देवाजी भिवाजी खोब्रागडेचे सडेतोड भाषण झाल्यानंतर त्यांच्या पुढाकाराने सर्वानुमते हिंदू लोकांकडून होत असलेल्या अस्पृश्यतेचा जुलूम व छळ नाहीसा करण्याकरिता डॉ. बाबासाहेब आंबेडकरांच्या घोरणाला अनुसरून धर्मातराला पाठिंबा देत आहोत, असा ठराव पास करण्यात आला.⁷ 25 जुलै 1937 रोजी अस्पृश्य वर्गाची एक सभा श्री. देवाजी खोब्रागडे यांच्या अध्यक्षतेखाली बल्लारशा जिल्हा चंद्रपूर, येथील कौलारी कैलाच्या मराठी शाळेत संपन्न झाली. त्यावेळी डॉ. बाबासाहेब आंबेडकर व आपले संघटन कार्य या विषयावर एस.टी. दानखंडे यांचे व्याख्यान झाले. त्यानंतर खोब्रागडेच्या अध्यक्षतेखाली धर्मातराच्या चळवळीस पाठिंबा देणारा ठराव पास करण्यात आला.⁸ 8 ऑगस्ट 1937 रोजी चंद्रपूर येथे श्री. एम.के. कांबळे यांच्या अध्यक्षतेखाली अस्पृश्य समाजाची एक मोठी सभा झाली. या सभेत 'अस्पृश्य समाज व धर्मांतर' या विषयावर श्री. देवाजी खोब्रागडे यांचे भाषण झाले.⁹ त्यानंतर डॉ. आंबेडकरांच्या सामुदायिक धर्मातरास पाठिंबा देणारा ठराव पारित करण्यात आला. डॉ. आंबेडकरांच्या धर्मातराच्या घोषणेनंतर अनेक ठिकाणी स्वतःहून अस्पृश्यांनी धर्मांतर केले. तेव्हा या संदर्भात 1 ऑक्टोबर 1937 रोजी चंद्रपूर येथे अस्पृश्यांची एक सभा मोहम्मद अब्दुल रहमान मास्तर यांच्या अध्यक्षतेखाली घेण्यात आली. या सभेत डॉ. आंबेडकरांच्या धर्मातराच्या घोषणेविषयी विचारविनिमय झाल्यावर या सभेत समाजात एकी व्हावी या दृष्टीने भाषणे झाली. त्यावेळी लोकांच्या खोट्या अमिषाला बळी न पडता डॉ. बाबासाहेबांनी धर्मातराची आज्ञा केल्याशिवाय कोणीही धर्मांतर करू नये, असे ठरविण्यात आले. यावर श्री. देवाजी खोब्रागडेचे भाषण झाल्यावर सभा बरखास्त करण्यात आली.¹⁰ 24 ऑक्टोबर 1937 रोजी चंद्रपूर येथे दलित फेडरेशनच्या विद्यमाने श्री. चोखामेळा विद्यार्थी बोर्डिंगचे सेक्रेटरी श्री. राघव कावरू कांबळे यांच्या अध्यक्षतेखाली 'दलित समाज उन्नती व चालू राजकीय परिस्थिती' या विषयावर श्री. देवाजी खोब्रागडे यांचे भाषण झाले. त्यात त्यांनी डॉ. आंबेडकरांच्या संकल्पानुसार कार्य करण्याचे सांगून, समाजातील लोकांची दिशामूल करणाऱ्या लोकांचा त्यांनी या सभेत निषेध केला.¹¹ अशाप्रकारे त्यांनी धर्मातराच्या बाजूने बिदर्भात जागृती करण्याचा प्रयत्न केला.

उच्च शिक्षणास महत्त्व : श्री. देवाजी यांनी शिक्षणाचे त्यातल्यात्यात उच्चशिक्षणाचे महत्त्व ओळखले होते. त्यांनी त्यांचा मुलगा भाऊराव उर्फ राजभाऊ याला बाबासाहेबांच्या मेट्रीला घेऊन गेले होते. त्यावेळी त्यांनी बाबासाहेबांच्या मार्गदर्शनानुसार राजभाऊला स्वखर्चाने उच्च शिक्षणाकरिता लंडनला पाठवले.¹² एवढेच नाही तर त्यांनी आपल्या सर्व म्हणजे पाच मुले व दोन मुली यांना उच्चप्रतीचे शिक्षण दिले. 1947 मध्ये श्री. देवाजी खोब्रागडे हे बल्लारपूर म्युनिसिपल कमिटीचे चेअरमन होते.¹³ मध्यप्रांत व वऱ्हाड मध्ये स्थानिक संस्थेच्या अध्यक्ष पदावर विराजमान होण्याचा पहिला मान त्यांनीच पटकाविला होता.¹⁴ याचा फायदा घेऊन त्यांनी डॉ. बाबासाहेब आंबेडकरांच्या 55 वा वाढदिवसा निमित्ताने बल्लारशाह येथे 14 एप्रिल 1947 रोजी सतत 14 दिवस पोवाडे, गायन, सभा, सहभोजन, शारीरिक खेळ, बौद्धिक चळवळी व समता सैनिक दल आणि समतासेविकांचा लेखन-वाचनाचा असे बौद्धिक व शैक्षणिक कार्यक्रम त्यांच्या मार्गदर्शनाखाली घेण्यात आले. त्यानंतर या सर्व कार्यक्रमात ज्यांनी पहिला नंबर पटकावला त्यांना 27 एप्रिल 1947 रोजी देवाजींच्या हस्ते बक्षीस वितरणाचा कार्यक्रम पार पडला.¹⁵ त्यांचा शैक्षणिक संस्थांशीही जवळचा संबंध होता. अशाप्रकारे त्यांनी डॉ. आंबेडकरांचा उच्चशिक्षणाचा संदेश आपल्या घरात व समाजात रुजविण्याचा प्रयत्न केला.

1937 ची स्वतंत्र मजूर पक्षाची निवडणूक डॉ. बाबासाहेब आंबेडकरांनी 1936 मध्ये स्वतंत्र मजूर पक्षाची स्थापना केली. त्यानंतर मुंबई इलाख्याबरोबरच मध्यप्रांत व वऱ्हाड येथेही 1937 साली होणारी निवडणूक या पक्षाने लढवायची असे ठरविले होते. त्यामुळे या भागातही उत्साह निर्माण झाला होता. ठिकठिकाणी उमेदवार निवडीच्या सभा होवू लागल्या. अशीच एक जाहीर सभा 22 डिसेंबर 1936 रोजी चंद्रपूर येथे श्री. चोखामेळा विद्यार्थी बोर्डिंग जवळ श्री. मुसाबुवा शिवराम सातारडे यांच्या अध्यक्षतेखाली झाली. ही सभा होणाऱ्या प्रांतिक कायदे मंडळाच्या निवडणुकीत बाबासाहेब आंबेडकरांच्या घोरणानुसार स्थापन झालेल्या मध्यप्रांत दलित फेडरेशनच्या वतीने कोण लायक व योग्य उमेदवार उभा करावा याची शहानिशा करण्याकरिता झाली. त्यानुसार चंद्रपूरचे श्री. देवाजी भिवाजी खोब्रागडे यांनी आजपर्यंत जी समाजसेवा केली ती लक्षात घेऊन त्यांना मध्यप्रांत असेंब्लीमध्ये उमेदवार म्हणून निवडून देण्याचा प्रयत्न करू. त्याप्रमाणे चांदा ब्रह्मपुरी खेडे विनागातील लोकांनी त्यांनाच मते देऊन निवडून द्यावे, अशी विनंती करणारा ठराव या सभेत पास झाला.¹⁶ या ठरावावर राघव काउरू कांबळे मास्तर चांदा व मुजंग दास भिवाजी चांदा यांची भाषणे झाली. पुढे डॉ. आंबेडकरांनी स्वतंत्र मजूर पक्षातर्फे त्यांनाच उमेदवारी देण्यात आली. त्यानंतर श्री. देवाजी भिवाजी खोब्रागडे सी.पी. अँड बेरार फेडरेशन उपाध्यक्ष आणि विठ्ठलराव साळवे जनरल सेक्रेटरी सी.पी. अँड बेरार फेडरेशन यांनी चांदा तहसील व ब्रह्मपुरी तहसील मध्ये ठिकठिकाणी दारे काढून सभा घेतल्या. त्यानुसार 28 डिसेंबर 1936 ला चांदा येथे श्री. विठोबा रघु बसंत यांच्या अध्यक्षतेखाली सभा घेण्यात येऊन देवाजी खोब्रागडे यांना पाठिंबा देण्यात आला. 1 जानेवारी 1937 ला

ब्रह्मपुरी येथे विठोबाजी रघुनाथ संत उमरेडकर यांच्या अध्यक्षतेखाली सभा होऊन श्री देवाजी भिवाजी खोब्रागडे यांना निवडून देण्याचा ठराव पास झाला. तर 4 जानेवारी 1937 ला नागपुर येथे सभा होऊन खोब्रागडे यांना निवडून देण्याचा ठराव पास केला गेला. 10 जानेवारी 1937 रोजी घुगूस येथे गजानन राजिराम यांच्या अध्यक्षतेखाली झालेल्या सभेतही देवाजी खोब्रागडे यांना बहुमताने निवडून देण्याचा ठराव पास केला. त्याच दिवशी बल्लारपूर येथेही सभा झाली. 12 जानेवारी 1937 ला सिंदेवाही येथे हरी धनुजी सावकार ग्रामपंचायत मॅबर यांच्या अध्यक्षतेखाली सभा झाली व खोब्रागडे यांना निवडून देण्याचा ठराव पास करण्यात आला. त्याचप्रमाणे दुर्गापुर, ताडाळी, मूल, सावरगाव येथे सभा होऊन देवाजी खोब्रागडे निवडून देण्याचे आश्वासने देण्यात आली.¹⁷ त्यानंतर 17 जानेवारी 1937 रोजी मुल जिल्हा चंद्रपूर येथे पंधरा-वीस खेडे मिळून श्री. लक्ष्मण भडके वैद्य मूल यांच्या अध्यक्षतेखाली सभा झाली. या सभेस बराच जनसमुदाय जमला होता. या सभेत, 'डॉ. बाबासाहेब आंबेडकरांनी स्थापन केलेल्या स्वतंत्र मजूर पक्ष आणि दलित फेडरेशन पार्लमेंटरी बोर्डाने संमती दिल्यावरून श्री. देवाजी भिवाजी खोब्रागडे चांदा मध्यप्रांत असेंब्लीच्या निवडणुकीत उमेदवार आहेत. त्यांची कामगिरी व हुशारी आणि काम करण्याची शैली पाहून त्यांनाच प्रांतीय असेंब्लीमध्ये निवडून द्यावे,' असा ठराव पास करण्यात आला.¹⁸ अशाप्रकारे त्यांनी संपूर्ण मागात दारे काढून हा भाग पिंजून काढला. चांदा-ब्रह्मपुरी खेडे विभागाची जनरल निवडणूक 8 फेब्रुवारी 1937 रोजी झाली. निवडणुकीच्या दिवशी कुणीतरी दुष्टपणाने त्यांच्या इमारती लाकडाच्या मोठ्या वखारीला आग लावली. या आगीत त्यांचे हजारो रुपयाचे नुकसान झाले.¹⁹ या घटनेला न घाबरता त्यांनी धैर्याने काम केले. या निवडणुकीचा निकाल 18 फेब्रुवारी 1937 रोजी लागला. त्यात श्री. देवाजी भिवाजी खोब्रागडे यांना 5133 मते, गजभिये तळोधी 1107 मते, कानप्याचे मालगुजार यांना 366 मते मिळाली.²⁰ त्यानुसार श्री. देवाजी भिवाजी खोब्रागडे हे निवडून आले. तेव्हा जमलेल्या मंडळींनी विजयी उमेदवारास फुलांच्या माळा घालून मिरवणूक काढली. मिरवणुकीनंतर श्री. दशरथ लक्ष्मण पाटील यांच्या अध्यक्षतेखाली त्यांच्या अभिनंदनाची सभा घेण्यात आली. अशाप्रकारे श्री. देवाजी मध्यप्रांत-वन्हाड असेंब्लीत स्वतंत्र मजूर पक्षातर्फे निवडून गेले.

मध्यप्रांत-वन्हाड असेंब्लीतील कार्य: श्री. देवाजी खोब्रागडे यांनी कायदेमंडळात स्वतंत्र मजूर पक्षाच्या भूमिकेनुसार कार्य केले. नागपूरचे श्री. हरदास एल. एन. यांनी सभागृहात पेन्शन विषय कपात सूचना मांडली होती. यास श्री. खोब्रागडे यांनी आपला पाठिंबा जाहीर केला होता. 17 सप्टेंबर 1937 रोजी यावर बोलतांना खोब्रागडे म्हणाले होते की, '...अगदी गरीब स्थिती केवळ दहा-बारा रुपये दरमहा पगारावर राहणारे लोक आपल्या पगारातून काहीही बचत करू शकत नाहीत आणि म्हणून म्हातारपणी नोकरी सोडल्यानंतर त्यांच्याजवळ स्वखर्चास काहीच उरत नाही. शेकडो रुपये पगार मिळविणाऱ्या अंमलदारांनाही पेन्शन मिळण्याची व्यवस्था आहे. परंतु आपल्या लहानशा पगारात भागविणाऱ्या नोकरांसाठी मात्र पेन्शनची सध्या व्यवस्था नाही...' त्यामुळे या कपात सूचनेला खोब्रागडे यांनी पाठिंबा व्यक्त केला.²¹ मात्र वित्तमंत्री डि.के. मेहता यांनी 1936 पासूनच पेन्शनच्या कायद्यात बदल करून दहा रुपये पेन्शन मिळण्याचा नियम केला गेला असल्याचे स्पष्ट केले. त्यामुळे श्री. हरदास यांनी आपली कपात सूचना मागे घेतली होती.

20 सप्टेंबर 1937 रोजी ऑनररी मॅजिस्ट्रेटच्या नेमणूका संदर्भात सभागृहात चर्चा झाली. त्यावेळी श्री. खोब्रागडेंनी काँग्रेस पक्षाने सुरुवातीला ऑनररी मॅजिस्ट्रेट पदाचा बहिष्कार केल्याचे आठवण करून दिली. मात्र आता काँग्रेसच्या लोकांना मॅजिस्ट्रेट व्हायचे असल्याने काँग्रेसला असहमत असलेल्या लोकांना या पदावरून काढून टाकणे अन्यायाचे होईल, असे ठासून सांगितले. त्याच बरोबर या पदाकरिता सुचविलेली निवृत्त माणसाच्या नियुक्तीस त्यांनी विरोध केला. कारण अस्पृश्य लोक नोकरीत नसल्याने त्यांच्या रिटायरमेंटचा प्रश्नच उद्भवत नव्हता. तेव्हा ऑनररी मॅजिस्ट्रेट पदावर निवृत्त व्यक्ती नियुक्त केल्या तर अस्पृश्य समाजाचे लोक मॅजिस्ट्रेट बनणारच नाही.²² असा प्रश्न त्यावेळी त्यांनी उपस्थित केला होता.

8 ऑगस्ट 1939 रोजी श्री. डी. बी. खोब्रागडे यांनी सी.पी. अँड बेरार कायदेमंडळात 'प्रांतिक सरकारला अशी शिफारस आहे की, गेल्या वर्षापेक्षा यावर्षी जास्त नापिकी झाल्यामुळे आणि शेतकरी पूर्ण महसूल देऊ शकत नसल्याने 50 टक्के जमीन महसुलाची सूट देण्यात यावी,' असा ठराव मांडला होता.²³ 1932 पासूनच राज्यात नापिकी सुरू होवून दिवसेंदिवस त्याचा परिणाम गरीब शेतकऱ्यांवर कसा होत गेला, हे सदनाला पटवून देण्याचा प्रयत्न त्यांनी केला. 1937 पेक्षा 1938-39 मधील परिस्थिती अधिकच खराब झाल्याने शेतसारा देण्याची ताकद शेतकऱ्यात मुळीच उरली नव्हती. तेव्हा हा ठराव कसा शेतकऱ्यांच्या हिताचा आहे व वन्हाडात वर्षानुवर्षे कापसाच्या येणाऱ्या गाड्यांची संख्या घटत असल्याने सर्वत्र नापिकी असल्याचे पटवून देतांना त्यांनी विक्रीसाठी येणाऱ्या कापसाच्या गाड्यांचे उदाहरण दिले. त्यानुसार अकोल्यामध्ये 1936-37 मध्ये 2,19,236, सन 1937-38 मध्ये 1,63,357 आणि 1938-39 मध्ये 1,18,968 गाड्या आल्या. तर अमरावती मध्ये 1936-37 मध्ये 2,22,608, सन 1937-38 मध्ये 1,79,978 आणि 1938-39 मध्ये 1,02,601 गाड्या आल्या. तसेच बुलढाण्यात 1936-37 मध्ये 1,66,414, सन 1937-38 मध्ये 1,07,200 आणि 1938-39 मध्ये फक्त 96,599 एवढ्याच गाड्या आल्या तर यवतमाळमध्ये 1936-37 मध्ये 1,48,904 तर 1937-38 मध्ये 1,76,962 आणि 1938-39 मध्ये तर फक्त 87,006 गाड्या आल्या होत्या.²⁴ या आकड्यांवरून कापसाचे पीक वर्षानुवर्षे कसे घसरत चालले आहे आणि गेल्या दोन वर्षांत कापसाचे पीक कसे निम्मावर आले हे स्पष्ट केले. वन्हाड हे कापसाचे माहेरघर असल्याने येथील कापसाच्या उत्पादनावरून संपूर्ण प्रांतातील पिकाबाबतची कल्पना येईल याबाबत त्यांनी सदनाला अवगत करून दिले. कापसाच्या पिकाकरिता येणारा खर्च व त्यातून येणारे उत्पन्न याचा विचार केला तर खर्चापेक्षा उत्पन्न कमी असल्याने शेतकऱ्यांवरील कर्जाचा बोजा 1930 मध्ये 80 कोटी रुपयांचा होता तो आता दुपटीने झाला असल्याने तो त्वरित दूर करण्यासाठी

सरकारने उपाय योजले पाहिजेत, अशी विनंती खोब्रागडे यांनी त्यावेळी सदनाला केली होती. तेव्हा सरकारला खरोखरच शेतकऱ्यांसाठी काही करावयाचे असेल तर त्यांनी शेतकऱ्यांमध्ये 50-सूट देणारा त्यांनी मांडलेला ठराव एकमताने पास करावा अशी देवाजी खोबरागडेनी सरकारला विनंती केली होती.²⁴ मात्र त्यांनी मांडलेला ठराव बहुमताच्या आधारावर तत्कालीन सरकारने फेटाळला होता.

सी.पी. अँड बेरार कायदेमंडळात सरकारतर्फे मंदिर प्रवेशाचे बिल सदनामध्ये मांडले गेले होते. त्यावेळी 16 ऑगस्ट 1939 ला श्री डी. बी. खोब्रागडेनी हे बिल सिलेक्ट कमिटीकडे पाठवण्याचा प्राईम मिनिस्टर साहेबांनी मांडलेल्या ठरावाला कसून विरोध केला होता. कारण अस्पृश्यांनी मंदिर प्रवेशाची मागणी केली नव्हती. त्यांची रोजगाराची व मजुरांना जास्त मजुरीची मागणी होती. त्यामुळे त्यांचे असे म्हणणे होते की, मंदिर प्रवेशाने अस्पृश्यांचे कोणतेही भले होणार नाही आणि या बिलात अस्पृश्यांना मंदिर प्रवेशास बंदी करण्याचा गुन्हा हा कॉन्ग्रेसबल अफेन्स समजला असता तर या बिलाला महत्त्व प्राप्त झाले असते. पण तसे न केल्याने केवळ मंदिराचे ट्रस्टी मनावर घेतील तर मग आम्हाला मंदिर प्रवेशास परवानगी मिळणार असल्याने असे बंदिस्त देव दर्शन घेण्यासाठी आम्ही तयार नाही. तेव्हा सरकारला खरोखरच अस्पृश्यांची अस्पृश्यता घालवायची असेल तर त्यांनी या बिलात, 'कोणत्याही सार्वजनिक देवळात जाण्यास अस्पृश्यांना मज्जाव नसावा, असे जर कोणी नाकारेल तर त्याला वारंट शिवाय गिरफ्तार करून घालान करण्यात येईल.'²⁵ असे नमूद केले असते तर खरोखरच काँग्रेस पक्षाला अस्पृश्यता दूर करावयाची आहे, असे दिसून आले असते. पण तसे न केल्याने त्यांनी या बिलाला विरोध केला होता.

श्री खोब्रागडे यांनी सदनात आलेले म्युनिसिपालिटी दुरुस्ती विधेयकाला 17 ऑगस्ट 1939 रोजी विरोध केला होता. कारण या बिलाच्या दुरुस्ती नंतर अस्पृश्यांचा केवळ एकच व्यक्ती म्युनिसिपालिटी मध्ये जाणार होता आणि या मुळे अस्पृश्यांच्या हक्कावर गदा येणार होती. त्यापेक्षा लोकसंख्येच्या आधारावर आरक्षण दिले पाहिजे.²⁶ त्यामुळे एकापेक्षा जास्त प्रतिनिधी म्युनिसिपल कार्पोरेशन मध्ये सहभागी होतील. परंतु अशा प्रकारचे जास्त प्रतिनिधी निश्चितपणे येण्याची काहीच सोय या बिलात केली नसल्यामुळे या बिलाने अस्पृश्य समाजाचे नुकस्तान होईल म्हणून यास खोब्रागडेनी विरोध केला होता.

कायदेमंडळात जेव्हा युद्धाच्या संदर्भातला ठराव आणला गेला, त्यावेळी 7 नोव्हेंबर 1939 ला श्री खोब्रागडे यांनी सरकारला स्पष्ट बजावले की, ब्रिटिश सरकारने भारतीय लोकांशी विचारविनिमय न करता इंग्लंड आणि जर्मन युद्धात भारतालाही सामील करून घेतले. हा दोष ब्रिटिश सरकारचा नसून काँग्रेसचा आहे. कारण ज्यावेळी युद्धाचे ढग जमा होऊ लागले होते, त्यावेळी महात्मा गांधींच्या आडूनसार मध्यवर्ती कायदे मंडळावर काँग्रेस पक्षाने बहिष्कार घातला होता. त्याचा असा परिणाम झाला की, गव्हर्नर जनरल ने आपल्या अधिकारातून भारताला युद्धात सामील करून घेतले. त्यामुळे या युद्ध परिस्थितीत भारताचा समावेश हा केवळ काँग्रेसच्या चुकीमुळे झाला आहे. तरी काँग्रेस मात्र अल्पसंख्यांक लोकांना विश्वासात न घेता ब्रिटिश सरकार सोबत स्वतः वाटाघाटी करीत आहे. याचाच अर्थ काँग्रेस कडून अल्पसंख्यांकांना विचारात घेतल्या जात नाही. म्हणून आमचा काँग्रेस सोबत झगडा आहे. आम्हाला जोपर्यंत उच्चवर्गीय सांख्ये सामाजिक, धार्मिक व राजकीय दर्जा जोपर्यंत प्राप्त होणार नाही, तोपर्यंत हा झगडा सुरुच राहणार.²⁷ म्हणून 1935 च्या राज्यघटनेनुसार अल्पसंख्यांकांच्या हिताला पूर्ण संरक्षण, तसेच अस्पृश्यांच्या अधिकृत संस्था व अधिकृत प्रतिनिधी जोपर्यंत घटनेला मान्यता देणार नाही तोपर्यंत अशी कुठलीही घटना आम्ही स्वीकारणार नाही, अशी सूचना यानिमित्ताने त्यांनी सरकारला केली होती. अशाप्रकारे श्री देवाजी खोब्रागडेनी विधिमंडळातील कामकाजात भाग घेऊन आपले योगदान दिले होते.

श्री देवाजी खोब्रागडेनी सदनातील प्रश्नोत्तराच्या तासात सहभागी होवून अनेक प्रश्न मांडले होते. 8 डिसेंबर 1937 रोजी प्रश्नोत्तराच्या तासात श्री देवाजी खोब्रागडे यांनी, नागपूर शहरात बेघर असलेल्या आणि सर्वसाधारणपणे रस्त्यावर व रेल्वे पुलावर पडलेल्या गरीब आणि निराधारांच्या सहण्यासाठी सराई किंवा आश्रम बनवण्यास सरकार प्रयत्नशील आहे काय? असा प्रश्न विचारला होता.²⁸ त्यावर अशी कुठलीही योजना सरकारची नाही असे उत्तर मंत्री डॉ खरे यांनी दिले. 9 डिसेंबर 1937 रोजी श्री देवाजी खोब्रागडे यांनी या प्रांतातून परदेशात जाणाऱ्या विद्यार्थ्यांना कॉलेजशिप देण्यात येतात काय? आणि सध्या दिलेल्या आहेत काय? असा प्रश्न उपस्थित केला.²⁹ त्यावर सभागृहाच्या सभापतीने असा प्रश्न उद्भवत नाही, असे उत्तर दिले. यावरून या प्रश्नाला उत्तर देण्याचे टाळाटाळ केल्याचे दिसून आले. एकंदर सभागृहात श्री खोब्रागडे यांचा महत्त्वपूर्ण सहभाग होता, हे दिसून येते.

मुल्यांकन :- श्री देवाजी यांनी आंबेडकरांनी चळवळ विदर्भातील कानाकोपऱ्यात पोहचविण्यात मोलाचे योगदान दिले. त्यांनी आंबेडकरांनी चळवळीला सरळ हस्ते आर्थिकदृष्ट्या मदत करून चळवळीला भक्कमपणे उभे करण्यास मदत केली. डॉ. आंबेडकरांच्या प्रत्येक चळवळीत श्री खोब्रागडे यांचा सहभाग होता. स्वतंत्र मजूर पक्षाच्या शाखा विदर्भात पसरविण्यात त्यांचा मोलाचा वाटा होता. डॉ. आंबेडकरांच्या धर्मातराच्या घोषणेनंतर या धर्मातराला पाठिंबा मिळविण्यासाठी त्यांनी अहोरात्र मेहनत घेतली होती. त्यासाठी ठिकठिकाणी सभा घेऊन याचे महत्त्व अस्पृश्यांना पटवून देण्याचे कार्य त्यांनी केले होते. 1937 च्या निवडणुकीतील त्यांचा विजय हा त्यांच्या लोकप्रियतेची साक्ष पटवून देणारी गोष्ट होती. त्यांनी सभागृहात अस्पृश्य, शेतकरी, मजूर, गरिबांचे प्रश्न मांडून त्यांचा आवाज सरकारपर्यंत पोहचविण्याचे महत्त्वपूर्ण काम त्यांनी केले होते. स्थानिक स्वराज्य संस्थेतही त्यांनी महत्त्वपूर्ण काम केले. त्यांचा मुलगा बॅरिस्टर राजामाऊ राजकारणात आल्यानंतर त्यांचा वयोमानानुसार सहभाग कमी होत गेला. तरी 1956 मध्ये डॉ. आंबेडकरांनी चंद्रपूर येथे बौद्ध धर्माची दीक्षा दिली त्यात त्यांचा महत्त्वपूर्ण सहभाग होता. पुढे त्यांचे 28 जून 1966 रोजी निधन झाले. एकंदरीत त्यांचे कार्य नव्या पिढीच्या तरुणांना प्रेरणादायी असे आहे.

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मराठी स्त्री गीते : अध्यात्माचे ऐतिहासिक विश्लेषण

रंजना मेश्राम
डॉ. अविनाश दि. फुलझेले

- पीएच.डी. संशोधक, इतिहास विभाग, राष्ट्रसंत तुकडोजी महाराज नागपूर विद्यापीठ, नागपूर
- मार्गदर्शक व इतिहास विभाग प्रमुख डॉ. आंबेडकर महाविद्यालय, नागपूर

सारांश: महाराष्ट्रातील मराठी स्त्री गीतांमध्ये अध्यात्मिक ओव्यांचे एक महत्त्वाचे असे वैशिष्ट्य पूर्ण स्थान आहे. अध्यात्मासारख्या अवघड विषयाचे स्त्री गीतांमधून येणारे उल्लेख हे दाखवितात की, अध्यात्माची जाणीव कृषी संस्कृतीमधील सामान्य निरक्षर स्त्रिला होती. मराठी संतांचे, महात्म्यांचे साहित्यातून अर्थात प्रवचन, भजन, विशेषतः वारकरी पंथातील संतांच्या अभंगातून, भारुडामधून त्यांनाही जाणीव झालेली दिसून येते. ज्ञानेश्वर, तुकाराम, नामदेवसारख्या संतांनी ईश्वराविषयी, माणुसकीच्या धर्माविषयी, योग आणि अध्यात्माविषयी सोप्या भाषेत जनसामान्यांना शिकवण दिली, त्याचे परिणामस्वरूप स्त्रियांची वैचारिक शक्ती, बुद्धी आणि अध्यात्म आत्मसात करून घेण्याची प्रवृत्ती स्त्री गीतांमधून समोर येते. संसारात राहूनही विरक्त होऊन परमात्म्याची लीन होण्याची त्यांची इच्छा व त्यातून मिळणारी मोक्षाची कल्पना दिसून येते. म्हणून स्त्रिया स्त्री गीतात म्हणतात ,

**पोथीपुस्तकांचा, मला कळना अनुभव
सावळ्या विठ्ठला, मला पंढरी दाव ¹**

पोथी-पुस्तकांमधून न कळलेले ज्ञान विठ्ठल भक्ती करणाऱ्या संतांनी समजावून सांगितले, नामस्मरण, सज्जनांचा सहवास, देवाची निश्चल भक्ती करण्याची प्रेरणा दिली व त्यातून अवघड वाटणारे जीवन जगणे सोपे झाले. मोक्षाचा मार्ग मिळाला. असा स्त्रियांच्या आध्यात्मिक जीवनाचा विशिष्ट पैलू दिसून येतो.

बीज संज्ञा : मराठी स्त्री गीते, अध्यात्म, स्त्रियांचे विचार.

प्रस्तावना :

भारतात लोकगीतांची परंपरा सुरु झाली ती सामूहिक जीवनाच्या सुरुवाती पासून जी आजपर्यंत कायम आहे. लोकसाहित्याची एक महत्त्वपूर्ण शाखा म्हणजे लोकगीत होय. भारतीय लोकगीतांमध्ये प्रांतिक, भाषिक, सांस्कृतिक विविधता दिसून येते. महाराष्ट्रातील लोकगीते ही ओवी, पदे, आख्याने, गद्यसदृश्य तोकडी रचना अशा विविध स्वरूपात आढळतात.² मराठी लोकसाहित्यामधील स्त्री

गीतांमध्ये ओव्यांचे प्रमाण जास्त प्रमाणात दिसून येते. स्त्रियांच्या गीतांमध्ये विधी गीते, उपासना गीते, सण-उत्सव गीते, खेळ नृत्य गीते, श्रम गीते इत्यादी प्रकार आहेत. स्त्रियांच्या गीतांमध्ये म्हणजे दळणकांडण करताना गायल्या जाणाऱ्या ओव्या किंवा गाण्यांमध्ये कौटुंबिक जीवनाबरोबरच त्यांच्या सामाजिक परिस्थितीनुसार त्यांना आलेल्या अनुभवातून आणि भजनकीर्तन, वेदपुराणे, रामायण-महाभारत कथांच्या नियमित

श्रवणामधून जे अध्यात्मिक ज्ञान त्यांना प्राप्त झाले ते आपल्या शब्दांमध्ये गावून त्यांनी समोर आणले आहे. त्यातून त्यांचा अध्यात्मिक पैलू समजण्यास मदत होते.

संशोधन पद्धती :

ऐतिहासिक संशोधन पद्धतीचा अवलंब करून उपलब्ध साहित्याचा शास्त्रीय दृष्टीने परीक्षण करून मूल्यांकन केले गेले आहे.

गृहीत तत्वे :

स्त्री गीते निरक्षर आणि अशिक्षित स्त्रियांची रचना असली तरी त्यांच्या गाण्यातून येणारे अध्यात्मिक विचार पारंपरिक जीवन जगणाऱ्या स्त्रियांच्या विचारांची प्रखरता व प्रगल्भता दिसून येते. तसेच त्याचा स्त्रियांनी सांसारिक जीवनात केलेला उपयोग दिसून येतो.

मराठी स्त्री गीतातून समोर येणारे अध्यात्म व त्यातून दिसणारा त्यांच्या जीवनाचा अध्यात्मिक पैलू :

अध्यात्माला सुरुवात, मध्य व अंत नसतो. अर्थात जे नित्य, निरंतर आणि सत्य आहे ते म्हणजे अध्यात्म अशी सरळ शब्दांमध्ये अध्यात्माची व्याख्या केली जाते. अध्यात्म समजून घेण्यासाठी व्यक्तीला स्वतःमध्ये बदल करणे आवश्यक असते. अध्यात्म असा विषय आहे की ज्याला समजून घेण्यासाठी व्यक्तीला ज्ञानाची उच्च कोटी प्राप्त करावी लागते, मात्र अशिक्षित स्त्रियांच्या ओव्यातून अध्यात्माचे तत्वज्ञान स्पष्ट व अनुकरणीय असे आहे. या सर्वसामान्य स्त्रियांनी जीवनातली मोठी शिकवण आपल्या अनुभवांमधून आत्मसात केली आणि आपल्या गाण्यांमधून पुढच्या पिढ्यांना हस्तांतरित केली. भारतीय दर्शनशास्त्रानुसार सर्व पदार्थ हे आकाश, जल, वायु, अग्नि, पृथ्वी ह्या पंचतत्वामधून निर्माण झाले आहे. त्याचबरोबर असे मानले जाते की, एका अदृश्य शक्तीने सृष्टीची रचना केली. त्या शक्तीला देव, ईश्वर, ओमकार स्वरूप परमात्मा असेही संबोधण्यात

येते. पुढील ओळींमधून स्त्रियांनी अध्यात्माची ही व्याख्या आपल्या शब्दात व्यक्त केलेली आहे.

पहिली माझी ओवी जगाच्या निर्मित्याला

आदी परमात्म्याला गाते मनोभावे ³

ज्या आदिशक्तीने जगाची निर्मिती केली त्याला ही ओवी समर्पित केलेली आहे. ज्या निर्मात्याने पृथ्वीची रचना करून मनुष्याला जीवनदान दिले त्याचे धन्यवाद या ओळींमधून केलेले दिसते.

दुसरी माझी ओवी शिव नी शक्तीला.

दोन्ही हात जोडूनी नमस्कार दोघांना⁴

परमात्म्याने दोन व्यक्तींना निर्माण केले व त्यांच्यापासून संपूर्ण मानव सृष्टी निर्माण झाली अशी संकल्पना सर्व धर्मांमध्ये आहे. हिंदू धर्मांमध्ये त्या दोन व्यक्तींना शिव आणि शक्ती म्हणतात. शिवशक्ती म्हणजेच प्रकृती आणि पुरुष. या दोघांच्या मिलनामधून संपूर्ण मानवजातीचा जन्म झाला म्हणून त्यांना दोन्ही हात जोडून स्त्री नमस्कार करते आहे.

तिसरी माझी ओवी तनाच्या त्रिगुणाला

सत्व रज तमाला⁵

भारतीय योग शास्त्रानुसार आणि आयुर्वेदानुसार शरीर हे सत्व, रज, आणि तम या त्रीगुणांनी बनलेले आहे. म्हणून तिसरी ओवी या तीन गुणांना समर्पित केली आहे हे तीन गुण मनुष्याच्या चांगल्या-वाईट कर्माचे कारण आहेत.

चौथी माझी ओवी ग, चारया खाणीला

जिथून होते उत्पत्ती, प्राणी याच्या

जातीला⁶

सर्व प्राण्यांची उत्पत्ती अंडज-अंड्यातून जन्मलेले स्वेदज-ओलसर जागी जन्म घेणारे जीवजंतू, उदभिज-बीज आणि भूमी फोडून वर येणारे आणि जारज-गर्भामधून जन्म घेणारे, अशा चार स्थानांमधून झालेली आहे, असे मानले जाते. ह्या चार ठिकाणांना स्मरण करून वरील ओळी म्हटलेल्या आहेत. मनुष्य

रूपात जन्म मिळाल्याचा धन्यवाद केलेला दिसून येतो.

पृथ्वी, आप तेज वायु आकाश या तत्वांना ओवी गाते पाचवी या पाची जणांना⁷

पृथ्वीची रचना करणाऱ्या पंचमहाभूतांचे आभार मानणाऱ्या या ओळी आहेत. वरील सर्व उल्लेखांवरून स्त्रियांनी केवळ त्यांच्या श्रवणशक्ती आणि मननशक्तीच्या आधारे विश्वाचे एवढे मोठे सत्य समजून घेतले होते हे दिसून येते .

सहावी माझी ओवी सहा शास्त्रे निर्मिलीवी चित्रे ऋषिमुनींनी⁸

भारतीय तत्वज्ञानाचे आधार असणारी सहा दर्शनशास्त्रे आहेत म्हणून येथे स्त्रियांनी त्यांच्या रचना करणाऱ्या ऋषीमुनींचे धन्यवाद केलेले आहे. दर्शनशास्त्रातील कर्म, ज्ञान, कल्पना, चिंतन, स्मरण अशा अध्यात्माच्या शक्तींची जाणीव स्त्रियांना होती हे ही वरील ओळींमधून दिसून येते. मनुष्याच्या आयुष्यात येणारा रोजचा नवीन दिवस काही सुख, काही दुःख, काही संकट तर काही प्रेरणा घेऊन येतो म्हणजेच उद्या काय होणार ही निश्चिती नसते म्हणून खालील ओळींमध्ये स्त्रिया म्हणतात की,

सातवी माझी ओवी, सात आठवड्यांचे वार आहे हा संसार, संकटांचा⁹

ह्याच प्रमाणे पुढील ओळींमध्ये भगवद्गीतेमधून अर्जुनाला अध्यात्माचे धडे देणाऱ्या देवकीच्या आठव्या पुत्राला म्हणजे श्रीकृष्णाला वंदन करून त्याने दिलेल्या ज्ञानाबद्दल आभार मानलेले आहे. तसेच द्रौपदीचा सखा म्हणून कृष्णाचे उदाहरण देऊन स्त्रियांनी हे सांगाथचा प्रयत्न केला आहे की, संकटाचे वेळी धावून येणारा देव हा सख्या प्रमाणे तारणहार असतो. द्रौपदीने वस्त्रहरणाच्या वेळी कृष्णाचा धावा केला होता असे महाभारतात प्रसिद्ध आहे.

आठवी माझी ओवी, आठवा देवकीचा सखा द्रौपदीचा, कृष्णनाथ¹⁰

पुढील ओळींमध्ये नवग्रहांचे उल्लेख करून आपले विचार स्त्रियांनी मांडलेले आहेत.

नववी माझी ओवी, अंतराळी नवग्रह संसारी आग्रह धरू नये¹¹

आकाशातील नवग्रहांच्या स्थिती व चालींचा मनुष्याच्या जीवनावर परिणाम होतो, असे हिंदू संस्कृतीमध्ये मानले जाते. ह्या गोष्टीला लक्षात ठेवून माणसाच्या बऱ्या-वाईट कर्मांचा परिणाम म्हणजे ग्रहांचे परिणाम हे जाणून स्त्रिया म्हणतात की, संसारी कुठल्याही गोष्टींचे आग्रह करू नये. जसे जीवन आहे, तसेच जगण्याचा प्रयत्न करावा. माणसाची दश इंद्रिये म्हणजे त्याची 5 कर्मेन्द्रिये, 5 ज्ञानेन्द्रिये आणि अकरावे मन त्यांचा खेळ म्हणजे त्याचे आयुष्य आहे, असे स्त्रिया खालील ओळींमधून म्हणतात मनाच्या स्वच्छ विचारांनी माणसाचे आयुष्य सुरळीत पार पडू शकते. अशा आशयाच्या खालील ओळी आहेत, अर्थात सर्व इंद्रियांना ताब्यात ठेवून जीवन जगावे.

दहावी माझी ओवी दर्श इंद्रियांचा अकराव्या मनाचा खेळ सारा¹²

अर्थात मनुष्याच्या इच्छा-आकांक्षा, त्याचे कर्म, त्याचे यश व पराजय त्याच्या हातात आहे, असे सांगताना स्त्रियांनी म्हटले आहे की, मनुष्याच्या हातात केवळ कर्म आहे आणि त्याचे कर्म म्हणजे आयुष्य सत्कारनी व्यतीत करणे होय ज्यामध्ये सत्य, सातत्य, संयम, समर्पण आणि निर्माण यांचा समावेश होतो. प्रत्येकाची उपासना पद्धती अध्यात्मापर्यंत जाण्यासाठी वेगवेगळी असते. योगी ध्यानस्थ होऊन आपले उद्दिष्ट साध्य करतात. तर भक्तिमार्गाचा माणूस नवसत्त्वभक्तीने एकरूप होऊन स्वतःला ईश्वराच्या चरणी समर्पित करून मोक्षाची प्राप्ती करून देतो, असेही स्त्रियांनी आपल्या गीतांमधून समोर आणलेले आहे. नवसत्त्वभक्ती म्हणजे

पहिली माझी ओवी, पहिली कामाला स्मरते रामाला अंतरंगी¹³

अर्थात् देव स्मरण करण्यासाठी आपल्या कर्माचा त्याग करण्याची आवश्यकता नाही हे सांगताना स्त्रिया म्हणतात, फक्त आराध्य देवतेचे मनःपूर्वक स्मरण करण्यानेही उद्धार होऊ शकतो.

बारावी माझी ओवी, संसारी बारा वाटा पुण्याचा करी साठा, क्षणोक्षणी¹⁴

माणसाचे चरित्र त्याच्या स्वतःच्या हातात असते हे सांगताना स्त्रिया म्हणतात की, संसारात चांगल्या आणि वाईट अशा अनेक वाटा आहेत. परंतु ते स्वतःला ठरवायचे आहे की, पुण्याचा साठा प्रत्येक क्षणाला कसा करता येईल, अर्थात् इथे नीतिमतेला धरून जीवन जगण्याची शिकवण दिलेली दिसते.

दुसरी माझी ओवी, दुजा नको भाव तरीच पावे देव संसारात¹⁵

शुद्ध मनाने केलेली प्रार्थना देवाला पोहोचते आणि त्याच्या कृपेने मनुष्याला संसारी राहून सुद्धा मोक्षाची प्राप्ती होते, असे वरील ओळींमधून म्हटलेले दिसून येते. स्त्रियांच्या ओळींमध्ये मुख्यतः महाराष्ट्रातील संतमहात्म्यांच्या सोज्वळ आणि सरळ शिकवणीचा प्रभाव दिसून येतो. जाती-धर्माचे, लहान-मोठ्यांचे, गरीब-श्रीमंतांचे बंधने तोडून सर्वांमध्ये समभाव निर्माण करणाऱ्या मराठी संतांची पुण्याई गाताना त्यांनी शिकवलेले अध्यात्मसुद्धा स्त्रियांनी आत्मसात केलेले दिसून येते. तसेच पुण्यांचा साठा करण्यासाठी तीर्थयात्रा करणे जरूरी नाही. मनातली श्रद्धाही तुमचे तीर्थयात्रेच पुण्य मिळवण्याचे साधन आहे हे सांगताना स्त्रिया म्हणतात,

काशी काशी म्हणून, लोक जाती दूरी काशी माझ्या घरी, तुळसा देवी¹⁶

तुळशीचे हिंदु धर्मातील आणि वारकरी पंथातील महत्त्व दाखवणाऱ्या ओवीमधून स्त्रिया म्हणतात की, पुण्य मिळवण्यासाठी काशीला जाण्याची गरज नाही. माझ्या अंगणातील तुळशीचे स्थान काशीप्रमाणेच पवित्र आहे.

फुले कोमेजति, वरचे तारे तुटती सर्वांना आहे च्युती, संसारात¹⁷

पृथ्वीवरील प्रत्येक सजीव एक दिवस नष्ट होतो हे सांगताना स्त्रियांनी म्हटले आहे की, मानवी शरीर नश्वर आहे. जसा उगवलेला सूर्य मावळतो, झाडांची पाने गळतात, फुले कोमेजतात आणि आकाशातले तारे सुद्धा गळतात म्हणजे उदय-अस्त आणि जन्म-मरण हे अटळ आहे. मरणाचे गूढ माणसाला उकललेले नाही. त्यावर अनेक तत्त्ववेत्त्यांनी, संत महात्म्यांनी व साहित्यिकांनी चिंतन केले आहे.¹⁸ निसर्ग नियमाने येणारा मृत्यू हा जीवनाचे अंतिम सत्य आहे. हे कुणीही ह्या निरक्षर, अशिक्षित स्त्रियांना शिकविलेले नाही, परंतु त्यांच्या अनुभवांनी, त्यांच्या लोकशिक्षणाने त्यांना ते शिकवले. याचे प्रमाण पुढील ओळींमधून मिळते.

आकाशी वावडी, वारत वरतिचा भर पडली धरणीवर, झाला कांबीचा चक्काचूर¹⁹

अर्थात् जोपर्यंत शरीरात चैतन्य आहे, तो पर्यंत त्याचे महत्त्व आहे. शरीरातील प्राण निघून गेल्यावर जसे आकाशात उडणारी पतंग वारे आहे तोपर्यंत उडते आणि वारं नसलं तर धरतीवर पडून चक्काचूर होते. ह्या ओळींमधून स्त्रियांनी एवढे मोठे तत्त्वज्ञान सरळ शब्दांमध्ये सहजतेने सांगितलेले आहे. कितीही धर्म विधी केले, व्रत वैकल्ये केली, तरी खरा धर्म माणुसकीचा, त्याचे पालन करून मनुष्य श्रेष्ठत्व प्राप्त करू शकतो हे सांगताना स्त्रियांनी म्हटले आहे की,

दुसरी माझी ओवी, दुजा नको भाव तरीच पावे देव, संसारात²⁰

अर्थात् कुणाशी दुजाभाव ठेवू नये सर्वांना एक समान समजून व्यवहार करावा अशी शिकवण या ओळींमधून दिली गेली आहे. स्वतःच्या जीवनाचे तीर्थ करून परमेश्वराला हृदयामध्ये ठेवणाऱ्या स्त्रिया जणू अध्यात्म आत्मसात

केलेल्या होत्या. स्त्रियांच्या गाण्यांमधून, ओव्यांमधून समोर येणारे त्यांचे तत्वज्ञान हेही दाखविते की, मोठ्यामोठ्या विद्वानांना अभ्यास आणि सरावानंतर कळले नाही. ते त्यांना दळणकांडण करताना, शेतात राबताना, संसारातील कष्ट उचलतांना समजले. सर्व सांसारिक सुख किंवा हाल-अपेष्टा सहन करून ही शेवटी एकच सत्य असतं ते म्हणजे मुक्ती. त्यासाठी संसार त्याग करण्याची जरूरत नसते माणसाची खरी परीक्षा संसारात राहून होते हे सांगताना स्त्रिया म्हणतात की,

**शिकती तराया, पाण्यात पडून
संसारी वावरून, मुक्त व्हावे²¹**

पाण्यामध्ये पडणारा, जसे आपले हातपाय चालवून पोहायला शिकतो त्याचप्रमाणे संसारामध्ये पडलेला माणूस संसारी दुःखांच्या, संकटांच्या, मोहाच्या, प्रसंगांमधून भक्तीच्या बळावर बाहेर निघू शकतो. अर्थात सर्व विषय वासनापासून मुक्तही होऊ शकतो. अध्यात्माचा व्यावहारिक जीवनात उपयोग केल्यास ऐहिक जीवनातील अनेक समस्यांचे समाधान होऊ शकते, तसेच माणसाचा सर्वांगीण विकास होतो हे जाणून त्यांनी म्हटले आहे की, अध्यात्माच्या अंगीकार केल्याने चारित्र्य उज्वल होते,

**संसारी मानावे लागते, सखी सुख
नाही तर सदा दुःख, चोहो बाजू
संसारी मानावे, लागते समाधान
सगळे मनीचे, होईना कधी कोण²²**

मनुष्याच्या सांसारिक जीवनात त्याच्या सर्व इच्छा पूर्ण होतील असे जरूरी नाही म्हणून त्याच्या जवळ जे काही आहे, त्यातच सुखी राहणे आवश्यक आहे. नसलेल्या वस्तूंची इच्छा करणे किंवा लोभ करणे, इर्षा करणे या सर्व मानवी स्वभावानुसार दुःख न करता जसे आयुष्य आहे तसे जगावे, नाही तर संसारामध्ये चारही बाजूने दुःख आल्यासारखे वाटेल. अर्थात लोभ-मोहापासून दूर राहावे. अध्यात्माची प्रवृत्ती सत्याला समजण्याची आणि आत्म्याला विवेकी

बनवण्याची असते. त्यामुळे माणसाचे संतुलन स्थिर राहते आणि तो मायाजाळात फसत नाही. धर्मांमध्ये दान आणि त्याग याला महत्त्व असतं. अध्यात्माची शक्ती समजून घेणाऱ्याला ते सहज समजून येते आणि तो आपल्या जीवनाला त्यादृष्टीने बघण्याला सुरुवात करतो. अध्यात्म म्हणजे माणसाची अशी दिनचर्या आहे की त्याच्या सत्व, तम, गुणात्मक प्रवृत्तीमधून योग्य ते गुण आत्मसात करून योग म्हणजेच भक्तीमार्गाचा अवलंब करून सातत्य, संयम, समर्पण आणि निर्माण ह्या गुणांचे पालन करणे आहे. ह्याचे संपूर्ण प्रमाण स्त्रियांनी गीतांमधून दिलेले आहे.

भारतीय तत्वज्ञानात आत्म्याला स्वयंप्रकाशित दीप म्हंटले आहे, या दिव्याच्या ज्योतीची परमतत्वाशी, परमात्म्याचे रूपाशी तुलना केली आहे. ज्याचे जीवन ज्ञानाच्या ज्योतीने उजळले आहे. त्याच्या जीवनात हे महत्त्वाचे कार्य आहे की, इतरांचेही जीवन प्रकाशमय करणे. प्राचीन ग्रंथांमधून या कार्याचे विवरण असे करण्यात आले आहे की, छोट्या दिव्या प्रमाणे स्वतःसाठी जगणे हा तामस धर्म आहे, दीपमालेप्रमाणे जगणे हा राजधर्म आहे आणि परमतत्वाचा चिंतनासाठी जगणे हा सात्विक धर्म आहे.²³ स्त्रियांच्या गाण्यांमधून येणारे अध्यात्म परमतत्वाच्या चिंतनाच्या मार्गाचा अवलंब करणारे सात्विक धर्माचे दिसून येते.

मूल्यांकन

भारतीय अध्यात्माचे आधार असणारे वेद-पुराण, रामायण-महाभारत, भगवद्गीता यासारख्या ग्रंथांचे पारायण, किर्तन तसेच यातील शिकवण संतांच्या भजनामधून, अभंगांमधून ऐकून स्त्रियांनी त्यातील अध्यात्मिक विचारांचे ग्रहण केले, त्यांचे महत्त्व समजून त्याचे आपल्या सांसारिक जीवनात पालन केले आणि स्वतःच्या कष्टकरी जीवनात सुद्धा या ज्ञानाच्या जोरावर सुखाचे, समाधानाचे क्षण शोधायचा प्रयत्नही केला, असे त्यांच्या

गीतांमधून दिसून येते. मराठी स्त्री गीतांचे केवळ साहित्यिक दृष्ट्या नाही तर सांस्कृतिक, ऐतिहासिक, अध्यात्मिक महत्त्व सुद्धा स्त्रियांनी समोर आणले आहे. त्यांचे हे अनुभवावर आधारित ज्ञान परंपरेने शतकानुशतके नवीन पिढ्यांपर्यंत पोहोचत आलेले आहे. स्त्रियांच्या अध्यात्मिक जीवनावर वेदपुराणांच्या शिकवणीप्रमाणेच मराठी संतांच्या शिकवणीचाही प्रभाव मोठ्या प्रमाणात दिसून येतो. स्त्रियांच्या या आध्यात्मिक जीवनाचे मूळ संत साहित्यामधून आलेले दिसून येते. कारण वैदिक

साहित्यातील कठीण वाटणारी अध्यात्माची शिकवण संतांनी आपल्या सोप्या शब्दांमध्ये, सांसारिक जीवनातील उदाहरणे देऊन जनसामान्यांना समजेल अशा भाषेत दिल्यामुळे आणि विठ्ठलभक्ती करणाऱ्या संतांचा सोज्वळ चारित्र्यामुळे त्यांच्या या शिकवणीचा प्रभाव जास्त प्रमाणात पडलेला दिसून येतो.

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HEIs AS CATALYSTS FOR TAPPING GOOD HUMAN RESOURCES FOR QUALITY SUSTENANCE AND QUALITY ENHANCEMENT IN EDUCATION DELIVERY SYSTEM

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Abstract

Since the educational landscape in the country is fast undergoing a major change, all higher educational institutions are required to undertake a massive re-vamping of their institutional frameworks to cater to the new emerging challenges of the times. Higher education institutions no longer play the kind of calculated role of indulging into mere classroom teaching like they hitherto did. Today these institutions are expected to become centres that facilitate not just enhancement in the domain knowledge of students but also that cater to their holistic development and that can mould them into employable youth who would become the strong backbone of the nation in years to come. Hence while they play this multi-faceted role, compliance to quality remains a huge challenge. In measuring quality parameters, the human resources that are available with an institution or which are accessible to an institution play a magnificent role. Hence this paper suggests some strategies that HEIs should adopt on a consistent basis for quality sustenance and quality management.

1. Introduction

Today we live in an age in which the higher education landscape in the country is undergoing a massive transformation. Higher education institutions no longer play the kind of calculated role of indulging into mere classroom teaching like they hitherto did. Today these institutions are expected to become centres that facilitate not just enhancement in the domain knowledge of students but also that cater to their holistic development and that can mould them into employable youth who would become the strong backbone of the nation in years to come. Hence the role that higher education institutions are expected to play range over a broad spectrum from the educational needs to the emotional and psychological development of the younger generation. Towards this end the University Grants Commission (hereinafter in short, referred to as UGC) as the apex governing body is weaving in several formal standards for higher educational institutions (hereinafter in short, referred to as HEIs) to comply with. The new and emerging paradigm of higher education is thus posing newer challenges for HEIs to cope up with this dynamics. While HEIs play this multi-faceted role, they also cannot negotiate with the requirement of quality. Hence quality sustenance and quality enhancement remain the perennial centres of focus and concern in the educational enterprise. There is an increasing significance that is now being placed on requirement of compliance to quality and this in return, faces HEIs with the challenge of devising newer strategies to ensure that quality is never compromised. However these emerging demands cannot be met unless HEIs have access to good human

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resource, among other resources, as human resource more than any other, has the greatest potential to bring about transformations. This paper attempts to shed some light on few strategies that can be adopted by HEIs for tapping good human resource through the use of technology or otherwise, for maintaining and enhancing quality.

2. Need for Quality Sustenance and Quality Enhancement:

Higher education in general and hence HEIs in particular are the key facilitators in achieving economic growth as well as all round development. They are centres that produce the future work force of a nation. However though the numbers of HEIs have grown exponentially, they are seen to be grappling with several problems like less number of faculty employed as compared to the student strength, poor quality of teachers appointed, lack of infrastructural facilities, often a complete disconnect between industry and the HEIs, and many others. Being so, these HEIs fail to meet the multi-dimensional demands that they are expected to fulfil. This is the primary reason that has led to an urgent need for engaging in a discourse on quality assurance mechanisms in the educational sector. Hence the Internal Quality Assurance Cells (IQAC) have been established in all institutions for ensuring that the entire organizational structure is built in a way that promotes quality. This has often required institutions to completely revamp their internal systems and create coherent mechanisms for quality sustenance. Institutions are now required to undergo NAAC (National Assessment and Accreditation Council) cycles of assessment and accreditation wherein the internal quality standards are subjected to continuous scrutiny. The IQAC is expected to be in continuous co-ordination with all stakeholders of education and seek their co-operation in maintaining quality.

But while one talks of quality maintenance in the domain of higher education, one dominant area in which quality can never be allowed to be compromised is the quality of teaching. And to be able to deliver good quality teaching, HEIs need good quality of human resource to deliver it. Hence access of students to experienced faculty members from whom enduring lessons can be learnt, remains an indispensable element of quality sustenance. However tapping the best human resource, whether local or global, for imparting quality education, and to allow its reach to the beneficiaries of the system, was often ridden with many difficulties in the traditional educational systems. It was not very easy to make the best of faculties in a particular subject/faculty available to students. In a large measure this becomes much more achievable today, partly through adoption of innovative practices in HEIs and partly through leveraging technology for benefit of education. In the section ahead, the author proposes adoption of some strategies by HEIs through which the benefit of enriched lectures, rich experience and the wisdom of some of the finest people can be allowed to percolate down to the learners. Thus in bringing this about the HEIs have to act as a bridge to connect the human resource to the student beneficiaries.

Why Human Resource?

This paper attempts to point out certain steps that HEIs can engage in, for tapping good human resource. But the question is, why the focus on human resource? Though admittedly a good education delivery system will need other resources as its indispensable requirement, yet human resource, the author believes, is the finest capital that an institution can boast of for sustaining quality. Human resource is the primary and non-negotiable need of any educational institution that has a key role to play in delivering education. However sometimes HEIs lag behind in terms



of compliance to quality simply by virtue of not having good human resources at all, at its disposal or owing to poor student faculty ratio. In such eventualities, the education delivery system is bound to falter. Hence this paper attempts to suggest the role that HEIs can play by adopting certain measures for tapping good human resources. The adoption of these measures can help in remedying the problems that arise either due to low student-teacher ratio or due to lack of availability of good human resources. Human capital is the finest investment for HEI and can play key roles in fostering quality. An institution that has the most advanced infrastructure will still fail without good human resource to optimise the use of infrastructure in meaningful ways. Hence HEIs need to become extremely conscious about the ways in which good human resources can be tapped for their institutional well-being.

Strategies to be Adopted by HEIs for tapping Best Human Resources for Quality Education:

Today HEIs must walk the extra mile to facilitate increased interaction between learners and finest of human resources who can re-define their futures in many meaningful ways. In today's age there are several strategies that HEIs can adopt as innovative practices to bring this interaction about. Given below is a four point programme that can be adopted:

1. Use of technology:

Today technological innovations have altered human life in unprecedented ways. Like all other domains of life, education too cannot remain un-touched by the reach of technological intervention. Hence delivering quality education will require an intelligent use of technology. Though technology can be used in various ways to enhance and sustain quality in education, yet what is suggested here is only the use of technology for tapping human resource in particular.

As they say that the world has come closer because of technology. Hence ICT enabled education makes it very easy for us to connect our learners on campus to the best of teachers and give to the students the benefit of listening to their lectures online. This can be facilitated through various ways:

a. SWAYAM (MOOCs): Today the most popular way of facilitating this connection is by encouraging students to sign up for Massive Open Online Courses (MOOCs) that are offered in their subject/discipline. So if a MOOC course is floated by, say for example, a faculty of Stanford University, this course can be opted online and by signing up for such a course, a student gets an access to the lectures by some best faculties in the world, to web resources and e-content that furnishes as good study material for the students. Thus such courses open up a whole new range of possibilities for a student, which they could never have otherwise got.

Now SWAYAM (Study Web of Active Learning by Young and Aspiring Minds) is India's own MOOC . Though MOOCs were used since long as powerful mediums for imparting education by the world's best Universities since long, India is witnessing the emergence of this only now. The Ministry of Human Resource Development is now encouraging Universities and HEIs to engage very intensely in promoting SWAYAM. SWAYAM works on the principle of education for "Anyone, Anywhere, Anytime" basis. Thus there are no limitations of the frontiers of place or



time. At one's convenience one can sign in and access the lectures as well as the study material. The introduction of SWAYAM has truly made education seamless today as the world's best faculties can be made available merely on the click of a button. And what's more interesting is that these courses are available absolutely free of cost. Hence they do not impose burdens of cost, neither on the teachers nor on the students. Infact today the UGC has taken up the promotion of SWAYAM so seriously that it has extended the benefit of these mutually to both, teachers and learners. The UGC is offering special incentives of additional points to teachers for either contributing to the development of e-content in any MOOC or for preparing an entire MOOC course . These points operate as huge incentives for teachers to seek promotions/placements through Career Advancement Schemes (CAS) or otherwise. For students, there is a scheme of credit transfer that is available. Courses available on the SWAYAM platform can be counted for a credit transfer up to 20% of the credits of the programme . If a course is a four credit course, it may have about totally 20 hours of video lectures and reading module and a course may have up to 40 modules. All these SWAYAM courses adopt the famous "4- Quadrant" approach which is generally followed in all e-learning systems . The first quadrant herein is the 'tutorial'. This includes audio as well as video lectures on the related course/discipline. It could also include video animations, simulations, virtual labs etc. Thus this quadrant tries to supply to the learners the experience of listening to faculty members like in an actual classroom in the conventional education delivery model. Quadrant II is about 'e- content'. This refers to specially designed reading material that will be shared with the enrolled learners. It will include e-Books, case studies, presentations, research papers, journals or also some links that will be shared for accessing good quality study material. The third quadrant is 'Assessment'. This includes some tests, quizzes, multiple Choice Questions, Long answer questions, short answer questions, preparation of FAQs etc. This is an important component of the course as these courses allow credit transfers to the students. Hence SWAYAM courses are the most powerful ways through which good human resource, both local and global, can be tapped and the benefit of their experience and wisdom passed on to the learners. Now HEIs can be instrumental in two ways here: firstly by popularizing SWAYAM courses amongst the students. And secondly, by encouraging their faculty to engage in the preparation of SWAYAM courses themselves.

Earlier one could not have thought of making such enriching lectures and study material of world class teachers available to students without having them to go anywhere.

b. Use of Google Classroom or Moodle for flipped or blended learning:

The use of Learning Management Systems (LMS) through other modes like Google Classroom or Moodle can be effectively used for making good human resource available. This can happen by the faculty members sharing the links of some quality lectures available on youtube with the students in google classroom. There is enormous material and videos available online but not all of them are of good quality in terms of their content. Thus the faculty members can be instrumental in scrutinizing and identifying good lectures by well known faculty members and make those links available to students. These links can be used for flipped or blended learning so that time can be saved and the syllabus also completed by exposing the students to the best human resources available.



2. Increased Industry-Institution Collaborations:

The second strategy that can be adopted by HEIs on a consistent basis is to facilitate greater collaborations between industry and the institution. The biggest problem with the current educational system is that we are unable to produce employable youth. This is because the needs of industry are rarely taken account of in the education we deliver. Hence with greater partnership between industry and institution, we could probably pool in human resource to furnish good insights towards making the needs of industry figure at all stages, right from designing of curriculum and syllabi to the actual delivery of education. If good company CEOs, or the heads of institutions where our students have a likelihood to be employed could be invited on a regular basis and if institutions could collaborate on a regular basis with them, they would become the finest human resource for delivering good quality education that can have the students seeking good employment opportunities in future.

3. Faculty and Student Exchange Programmes:

HEIs must take initiatives in holding Faculty exchange programmes on a regular basis. This can either be an exchange between faculty members of another institution in the same place or preferably from another place. This can be fostered through MoUs (Memorandum of Understanding) between two institutions. This by far, remains the best way available to tap good human resource and make the benefit of it available to students. Thus such exchange programmes can be scheduled for a duration of one week or so and that time span can be used very advantageously for facilitating an increased interaction between faculty and learners. New minds are capable of adding a fresh lustre of understanding on a subject and will also break the monotony of the lectures being delivered by the same faculty members all through the learning period.

The same result can be achieved by facilitating student exchange programmes as well so that students get exposed to the knowledge and wisdom of human resources in other institutions and reach out to them for a more fulfilling learning experience. Apart from being a technique for tapping good human resource, this method also exposes the students to other institutional cultures which can then be inculcated in our own HEIs for quality sustenance.

4. Faculty Development Programmes:

As a part of the routine course, faculties within institutions are mandatorily required to attend Orientation and Refresher Courses of 21 days duration which are organized by Human Resource Development Centres of all Universities. But over and above these, HEIs must encourage their faculty members to be a part of other FDPs on a consistent basis. This can be done either by the HEIs organizing such FDPs themselves or making their faculties attend such programmes hosted elsewhere. Now-a-days a number of such FDPs are available online also. Such online courses do away with the difficulty of having to relieve teachers from their on-campus engagements also. A number of institutions already undertake these exercises as a requirement for their NAAC accreditation. However HEIs must make conscious efforts to ensure that such FDPs do not become mundane, compulsive exercises for teachers. Their content must be designed in such a



way that all these FDPs not only result in updation of knowledge of teachers themselves but more importantly, keep them motivated for doing good work. Virtues like team spirit, intellectual integrity etc need to be fostered and re-ignited in their minds over and over again. There can be sessions on creative or critical teaching. Such initiatives can be largely instrumental to unpack the hidden or dormant potential in every teacher. For, a motivated teacher is the finest human resource who can meaningfully transform the lives of a whole generation.

Conclusion:

This paper is an attempt to suggest certain measures and initiatives that all HEIs can undertake in order to be able to tap the best human resources available, for the benefit of the beneficiaries of our education system. As mentioned above, most of these strategies may have been already adopted by some institutions. However, the author suggests that these must be taken up as a part of regular institutional initiatives on a **CONSISTENT** basis. Also, another note of caution is that these should not be taken up in a routine and mundane manner, or for purposes of creating records only. They must be undertaken in a meaningful way so as to ensure compliance to quality that is enduring.

A consistent use of the aforementioned strategies by HEIs in their institutional framework can indeed bring about a sea change in the quality of education that they can deliver. Each of these allow HEIs to become a bridge that connects its learners with good human resources and thereby bring about both, quality sustenance and quality enhancement.

“Dying With Dignity” – The Promises and Problems of Common Cause, A Registered Society Vs Union of India”

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1.Introduction:

In 2018, in Common Cause, a Registered Society vs UoI¹ (in short, referred to as Common Cause) a 5 judges Bench of the Supreme Court of India legalized ‘passive euthanasia’ subject strictly, to the procedure laid down in guidelines of the court. It also recognized the concept of Advance Directives. The judgment is hailed as one which celebrates ‘personal autonomy’ of the individual. However on a closer evaluation, it looks like a mixed bag of promises and problems, especially with respect to individual autonomy. This paper seeks to critically comment on the commendable and the condemnable aspects of this judgment.

2.The achievements of Common Cause:

Common Cause marks a major victory for the champions of ‘death with dignity’ claims. Through a detailed analysis of the complex issue of euthanasia, the court uses its interpretive tool to read ‘right to die with dignity’ as a facet of the ‘right to live with dignity’ under Article 21. In holding this, the court gave an elaborate consideration to the intertwined cobweb of emotional, moral, religious and psychological aspects, apart from evaluating the legal position on this point in other jurisdictions of the world². The case unleashes a completely new dimension of human **dignity**. It also depicts the humaneness of the law that is concerned about the quality of life, of death and of dying.

The judgment has been especially hailed as path-breaking for, by recognizing Advance Directives/Living wills for the very first time in India, it indeed celebrates **personal autonomy**. It enables a person to express his categorical wish in advance, of what must be done to him, if ever he slips into a ‘Persistent Vegetative State’ (PVS) in future. Thus the autonomy of the person can be respected and given effect to, even if, at any future unfortunate moment, the person becomes incapable of expressing any wish. Recognition of Advance Directives also eases the complications for the care-takers/relatives of the patient by relieving them of any attendant guilt in taking the decision to withdraw life-support. Hence to that extent, the judgment is commendable indeed.

¹ Common Cause, A Registered Society vs UoI and Another (2018) 5 SCC 1.

² Id at 54-59,103.

3. The Discontents of Common Cause:

Firstly, as a general comment, it may be observed that this judgment looks like a compilation of four exhaustive essays on euthanasia, loaded in intense philosophical ideas about life and death. Notwithstanding that there is no dissent, yet four separate ornately worded opinions have been penned. Such lengthy judgments, it is respectfully submitted, can be avoided, thereby enabling a reader to get to the important aspects thereof with greater ease.

3A. Preliminary Objections:

The Court has issued guidelines³ relating to Advance Directives and the procedure that must be followed before an Advance Directive can be given effect to.

Before indulging into a substantive review of the guidelines on merits, one is compelled to ask a more preliminary question about the propriety of the court to devise a procedure for deprivation of life through the strategy of judicial guidelines. When Article 21 proclaims that “No person shall be deprived of his life and personal liberty except according to **procedure established by law**”(emphasis supplied), one has to remember that Article 21 is addressed to the legislature and not to the judiciary. In matters of deprivation of life (which is precisely in issue here) the law and the procedure must be prescribed by the democratic legislature and not by the non-democratic judiciary. Hence I argue that if passive euthanasia has to be legalized, the appropriate institution that must be engaged in laying down the procedure therefor is the legislature alone. Though the court does express the anxiety and hope that legislature will engage itself sooner in the task of enacting the necessary law, yet until such a law is enacted the court says that its guidelines shall be the binding law. Vishakha’s⁴ case is a grim reminder that the day when the legislature will deliver the law may not dawn sooner⁵.

Secondly, the court has followed the Vishakha precedent in filling the legislative vacuum through its guidelines. However even on this count, such an application of the Vishakha precedent (towards laying down guidelines) seems incorrect. In Vishakha, apart from the specific violation of fundamental rights under Articles 14 & 21, there was also an obligation under CEDAW, to which India was a signatory. Such an obligation was not there in the present case. Hence the court should have ideally confined itself to declaring whether right to die is a part of right to life, leaving the subsequent task of specifying the procedure for ending life in the hands of the legislature. Secondly, in Vishakha, when the court laid down guidelines against sexual harassment of women, by doing so, it added something more to the quality of life. In that sense, Vishakha was a life-enriching judgment. However, arguably, Common Cause is a verdict about

³ Id.at 129-134

⁴ Vishakha vs State of Rajasthan AIR 1997 SC 3011.

⁵ The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal Act) was passed in 2013 while the Vishakha judgment was of 1997.

‘deprivation of life’. Can the life-enriching jurisprudence of the court apply *mutatis-mutandis* to cases of life deprivation as well? These questions invite us to ponder over the propriety of the court to step into the shoes of the legislature for prescription of a procedure for deprivation of life.

3B. Analysis on Merits:

Turning the register of analysis now to the merits of the guidelines issued by the court, one needs to understand the entire procedure prescribed for giving effect to an Advance Directive. The judgment stipulates a four-stage mandatory procedure before the desire of the patient for withdrawal of treatment/life support can be given effect to.

First, the treating physician will have to be made aware of an Advance Directive made by the patient who then, will ascertain the genuineness thereof from the jurisdictional JMFC and will fully satisfy himself that the executor is indeed terminally ill and cannot be cured through medical treatment. On being satisfied, the physician is duty bound to explain all possibilities to the executor of the Advance Directive if he is competent and conscious, or to his guardian/close relative in case the executor is not conscious. This will include information about the nature of illness, the medical treatments available, the consequences of the treatment as well as the consequences of remaining untreated. After making sure that it is fully understood and that they have thought over all the available options, and yet believe firmly that withdrawal of treatment/life support is the best thing to do, then comes the second level of safeguard/procedure.

The treating physician or the hospital where such a patient is admitted will constitute a Medical Board. This Medical Board will comprise of the Head of the treating department and atleast three experts from the fields of general medicine, cardiology, neurology, nephrology, psychiatry or oncology with experience in critical care and a standing practice of twenty years. The doctors nominated on the Board will visit the patient in the presence of the guardian/close relatives of the patient in order to be satisfied that it is, from all points of view, a fit case for withdrawal of treatment/life-support. The opinion of this Board will be a ‘preliminary opinion’. If this medical board records its opinion that the instructions given in the Advance Directive can be given effect to, then, the third stage in the procedure sets in.

The treating physician or the hospital concerned is ‘forthwith’ required to inform the jurisdictional Collector about their opinion. The Collector will then constitute another Medical Board comprising of the Chief District Medical Officer (Chairman) and three other expert doctors from any of fields and experience as above. The Collector’s Medical board cannot however have any doctor from the Hospital’s Board. The guidelines mandate that the doctors in this medical board should firstly satisfy themselves about the genuine wishes of the executor of the Advance Directive and make sure that it is an informed decision, or in case the executor is incapacitated then they must obtain the consent of the guardians/close relatives of the patient

with regard to withdrawal of medical treatment/life support. After ensuring this, the doctors on the Collector's medical board will jointly examine the patient. On such examination, if they agree with the preliminary opinion, they may endorse a certificate for permitting the hospital to give effect to the instructions in the Advance Directive. This permission will be granted only 'to the extent of and consistent with the clear instructions given in the Advance Directive'. Once this endorsement is made by the Collector's Medical Board, now sets in the fourth step in the process.

The Chairperson of the said board must convey their decision of withdrawal to the jurisdictional JMFC before giving effect to their decision. On such intimation, the JMFC will personally visit the patient "at the earliest" and examine all aspects with regard to the observance of the entire procedure and genuineness of the informed decision of the executor and only then authorise the implementation of the decision taken by the Board.

This is the minimum mandatory procedure that must be complied with before one can give effect to the 'autonomous choice' of the patient about how he must be dealt with at the terminal stage of his life. Now the following aspects deserve attention:

3B(i). Burdensome and Time Consuming Procedure:

What is self-evident is that the procedure is too onerous and time-consuming to enable a person to reap the benefits of an informed and autonomous choice which he has already made. It is important to remember that in all such cases we are dealing with patients who are in the last stages of life and the central idea is to ease the process of dying. But the judgment does not give any specific time-limit within which the whole procedure must be completed. Hospitals with smaller set-ups are often unlikely to have doctors with the requisite experience from the required field of expertise. In such cases they will be required to involve services of such doctors from outside. Will an outside doctor agree to be a part of such a Board? Will he find the time from his own busy schedule (given the fact that all doctors on the Board will be senior ones from specialized fields) to render an opinion? How much time will the hospital and the jurisdictional Collector take to constitute the respective Boards given all these difficulties? All courts in India are already over-burdened with huge pendency and backlog. Given this fact, when will the JMFC find time to personally visit the patient? The bureaucratic inertia in India does not paint a happy picture to generate confidence that these matters will be attended with the required urgency 'to ease the process of death'. It is most likely that the person at the terminal stage of his life will even otherwise exit from the world without his wish being fulfilled, while these procedures are pending or will be languishing in hospital bed subjecting himself to a treatment he has never wanted to undergo. In both cases, the person's autonomy is allowed to evaporate in thin air. Thus the autonomy is likely to die before the patient dies.

3B(ii). Considerations of Cost:

The judgment also does not comment on whether any fees will have to be paid to such doctors nominated on the Board. For, if no fees need be paid, then doctors may not agree to give an opinion as they will have neither time nor interest for thankless jobs. On the other hand, if fees have to be paid to these doctors then, who bears that expense? If it must be borne by the patient/the family members of the patient then they bear an additional cost for giving effect to their autonomous decision. They are already incurring the expenditure for the hospital bed, treatment if any, apart from the fees of the treating physician. But now they will be required to incur additional expenses for the fees of eight other doctors on the two medical boards taken together! Is there some minimum fees for the JMFC's visit that will be required to be paid in court? Nothing of this has been clarified in the judgment. What this only means is that autonomy will come with a huge cost.

Also, especially in corporate hospitals wherein health care is a business for profit, one cannot negate the possibility that the Hospital Medical Board might advise continuation of life-support not because it is perceived as necessary to revive the patient back to meaningful life, but simply for the handsome monetary gains pouring from the use of hospital/ICU bed, ventilator or other support system etc.. In such an eventuality, the Board might not agree for withdrawal and then the patient/relatives will be required to approach the High Court for permission to act upon the Advance Directive. The High Court might think it fit to appoint yet another Medical Board of its own, which means more doctors and more expenditure. Such a tedious procedure for preventing abuse is most likely to result in corruption.

3B(iii). De-personalization in the Process:

A person is entitled to choose a doctor/physician of his choice for getting himself treated. This choice could depend on a variety of factors like for example, the doctor's competence, or the doctor being personally known to him, etc. to name just a few. When a physician/doctor treats a patient for many years, knowingly or unknowingly, a bond develops between the two. Infact a person continues to go to a particular doctor only because he begins to repose some trust and faith in that doctor. However when it comes to the Medical Board, either the one appointed by the Hospital or the Collector, it is most likely that the doctors appointed on such Boards will not even be known to the patient/his relatives, leave alone being ones of his choice. And such doctors then will be tendering an opinion that has a bearing on the patient's intimate choice about his life/death. This, in my opinion, brings about a painful de-personalization (or more precisely, pluri-personalization) in the entire process.

3B(iv). Emotionally Burdensome Procedure:

In case the opinions of the two medical Boards and the treating physician do not concur, then the guidelines stipulate that the patient/relatives may approach the High Court under Article 226 of the Constitution of India, seeking permission to act upon the wish expressed in the Advance Directive. When the patient is living the last days of his life, ailing and suffering, he as well as his relatives are under considerable stress. If in the midst of this, they are required to pay visits to the courts and lawyer's chambers, then this could rather operate as intimidating factors in the way of giving effect to the genuine wishes/desires of the patient. Thus again the autonomy of the patient will have to be compromised at the cost of the cumbersome procedures.

4. Conclusion:

This paper reflects on the positive and negative aspects of the judgment in Common Cause. It raises a preliminary objection against the court's initiative to prescribe a procedure for ending life through the strategy of guidelines. I argue that the judiciary cannot arrogate to itself a power which must reside in the hands of the democratic and representative legislature, especially in view of the fact that it is a matter regarding the end of life. Even otherwise, Article 21 is directed to the legislature and not to the judiciary. But if one were to travel beyond these preliminary objections and undertake an analysis of the judgment on merits, then the judgment is a mixed bag.

The decision in Common Cause is indeed commendable in so far as it recognized the 'right to die with dignity' as an aspect of the 'right to live with dignity' under Article 21. It holds in its womb a promise and hope that a person will now no longer be compelled to undergo degrading and torturous medical treatment against his will. The person can, in advance, determine how he should be treated if and when, on a later occasion, he enters into the persistent vegetative state. Thus unnecessary medical interventions can be avoided and that too without generating any guilt in the minds of close relatives and family members. In giving a place to death with dignity within the compass of Article 21, the judgment marks a great leap forward in enriching Constitutional jurisprudence in India. It re-defines dignity by extending it beyond the realms of life on the temporal plane and attaches it to death and the dying process as well. Also, by recognizing the concept of Advance Directive, the court gives a premium to the personal autonomy of the individual.

However while the judgment does celebrate autonomy at the theoretical level, from the practical standpoint, it looks like being a complete farce of autonomy. The procedure for withdrawing life-support or medical treatment, whether with or without Advance Directives is shrouded in a maze of time consuming technicalities. Though these technicalities seem to have been weaved in for ensuring that there is no abuse, yet the procedure itself could result in frustrating the very autonomy it is meant to uphold. Thus it is like throwing the baby with the bath-water. Instead

simpler and friendlier procedures could be incentives for more number of people to write Advance Directives for making their last days as consistent with their ideas about dignified exit, as possible.

This paper ends in the hope that whenever the legislature takes upon itself the task of framing a law on this point, it must give due regard to these practical difficulties and ease out the unwanted, avoidable burdens of lengthy and costly procedures. That would be the most appropriate tribute to the ‘autonomy-dignity’ duo.



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**NATIONAL SECURITY CONCERNS IN ARTICLE 355 OF THE
CONSTITUTION OF INDIA AND THE NEW HORIZONS OF
“EXTERNAL AGGRESSION”: A CRITICAL APPRAISAL IN THE LIGHT
OF THE JUDGMENT IN THE *SARBANANDA SONOWAL* CASE**

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ABSTRACT

The concept of National Security is one of unfading significance and it is evolving and expanding in the modern times. National security scholarship puts forth two ideas of the concept today. One is the classical concept which looks at national security from the prism of military security only and rather focuses on physical attacks or physical threats to the security of nation states. Two is the modern concept which is not concerned with physical attacks, but encompasses a vast number of non-military elements too, which are concerned with ‘well-being’ of individuals within nation-states, as opposed to mere physical safety. In the present day world, wars do not pose so much of an existential threat to states as other problems like hunger, unemployment, diseases, health, disasters, environment degradation, climate change etc. do. Thus national security will have to accommodate emerging components in the form of food security, water security, health security, environmental security, disaster security, education security and many more. Now Article 355 of the Constitution of India is primarily concerned with the classical concept of national security. This paper is an attempt to discuss the nature of security concerns that radiate from this Article. This paper also attempts to demonstrate how the new horizons of the term “external aggression” as laid bare in the *Sonowal* case is an endorsement by the judiciary of the modern concept of national security.

Introduction

“National Security” has become one of the most evolving concepts of the present times. It is a terminology that has evoked a good degree of debate and discussion in various forums on national governance. But the scope and contours of this term have rapidly changed in the present day. Earlier it was a term that was associated with physical security only. Hence national security as understood in the days of the warring periods was associated with military security and the preparedness of the armed forces in securing a nation from another with whom it was at war. However today we do not live in the age of conventional warfare. Rarely do we see a nation in a state of formally declared war with another country. Today dangers to national security are posed more by terrorism, militant attacks, naxalism etc which are situations falling short of the state of war. These are all nonetheless examples of

physical attacks jeopardizing national security. Such situations, though different from wars, are still a part of the classical idea of national security as they concern themselves more with the physical aspect of security. Today, national security scholarship worldwide tables two views about the concept of national security; the classical/traditional one, which views national security from the military prism alone and the modern/widened one, which strives to bring almost all areas of human endeavor within the compass of the term [1] Thus food security, climate security, health security, water security, environmental security, cultural security etc are just few of the evolving components of the modern notion of national security. This modern concept of national security is structured on the thesis that in the present age the security posture of a nation is as much affected by factors like scarcity of food and water, climate change, insufficient health care facilities, environmental degradation etc., as it is by any forms physical attacks. Hence each one of these is as much a security issue as military preparedness. Today's world affected by COVID19 presents an illuminating example of how health security can affect the overall national security of every country. This is the modern concept of national security.

Article 355 of the federal Constitution of India casts a duty on the Centre to protect the states against external aggression and internal disturbance and also imposes an obligation on it to ensure that the government of the state is carried on in accordance with the provisions of the Constitution. Now when the Constitution uses the twin words, 'external aggression' and 'internal disturbance' prima facie its hint is on issues relating to the physical aspect of security. Hence Article 355 of the Constitution concerns itself with physical security and thus it reflects the classical idea of national security. However, the Supreme Court of India, in the case of *Sarbananda Sonowal vs Union of India* [2], has given a much expanded interpretation to the term 'external aggression.' Speaking in the context of the large scale influx of illegal immigrants from Bangladesh into the state of Assam, the Supreme Court of India said that this amounts to external aggression within the meaning of Article 355. Thus new horizons of interpreting the word 'external aggression' were laid bare by the Court, which had nothing to do with physical attack or physical aggression *per se*. Hence this paper argues that such an interpretation is demonstrative of the new modern concept of national security being endorsed and applied by the Supreme Court of India. This paper also attempts to throw light on the national security concerns addressed by the Constitution of India in Article 355 and engages into a critical analysis of the court's judgment in the *Sonowal* case on some established Constitutional principles.

Objectives of the Study

The objective of this study is two-fold. Firstly it seeks to probe into a complete understanding of Art. 355 of the Constitution, by looking into its Constitutional history and secondly, it seeks to demonstrate how the court's interpretation of the term "external aggression" in Art 355 of the Constitution is a classic illustration of the incorporation of the modern concept of national security, since the court adopts newer and hitherto unknown horizons of interpreting the term.

Methodology of the Study

This paper is a theoretical, doctrinal kind of study and uses secondary data like judgments of the courts, Constituent Assembly Debates, journal articles, reference books etc as the sources. It indulges into a theoretical and critical analysis of the judgment of the Supreme Court to present a new argument about the endorsement of the modern concept of national security.

Article 355 - Its Constitutional History

Article 355 of the Indian Constitution is a very cardinal provision in the Indian federation. It imposes a two-fold obligation on the Indian Union. Before analyzing the provision or before peeping into its history, it would be apposite to read what the provision prescribes. Article 355 reads as under:

Article 355: Duty Of the Union to protect States against external aggression and internal disturbance: "It shall be the duty of the Union to protect every State against external aggression and internal

disturbance and to ensure that the government of every State is carried on in accordance with the provisions of this Constitution”.

Pertinent to note that Article 355 of the present Constitution was Draft Article 277A. Dr. Ambedkar had introduced this Article and when the same was debated on the floor of the Assembly, some members doubted that a provision of this kind could interfere with the provincial autonomy of the states. However Dr. Ambedkar explained the reasons that made the inclusion of this Article necessary.[3] He said that within our federation, barring the provisions which permit the Centre to override any legislation that may be passed by the Provinces, the Provinces have a plenary authority to make any law for the peace, order and good government of the province. Thus the Centre’s intervention in these spheres must be deemed to be barred, because that would invade the sovereign authority of the province. This being so, if the Centre were to interfere in the administration of provincial affairs (as provided for in Article 356, draft Articles 278 and 278A) it must be by or under some obligation which the Constitution imposes upon the Centre. The invasion must not be an invasion which is wanton, arbitrary and unauthorized by law. It was with this purpose that Article 355 was introduced into the Constitution.

The duty cast on the Centre by virtue of this Article is two-fold:

1. To protect every State against external aggression and internal disturbance;
2. To ensure that the government of every State is carried on in accordance with the provisions of the Constitution.

It has been said that the two limbs of Article 355 are not interdependent. That is to say, a Constitutional breakdown can take place in a State even without there being a situation of external aggression or internal disturbance [4]. A provision analogous to this one is to be found in the other federal constitutions also, like for e.g. the American and Australian Constitutions. Under the American Constitution, the Central government is duty bound to guarantee to every State a Republican form of government and to protect a State against invasion, and, on application of the State Legislature or , of the Executive (when the Legislature cannot be convened), against domestic violence [5]. Further, Section 119 of the Australian Constitution provides in very express terms that the Centre shall protect every State against invasion, and, on application of the State Executive against domestic violence. There is an important distinction between the Indian provision and the parallel provisions in the American and Australian Constitutions. Under those federal Constitutions, application by the State to the Centre is essential before Central intervention, whereas no such condition is prescribed in the Indian Constitution. Thus there is no pre-condition of a request/application from the State before the Centre can act under Article 355. The Supreme Court of the United States of America has however laid down that if internal disturbance in any State interfered with the operation of the National Government itself, or with the movement of inter-State commerce, then the Centre can send force on its own initiative, without waiting for the application of the State authorities [6]. With this ruling, the requirement of an application by the affected State comes into grave doubt.

Under our Constitution, the terms used are “external aggression” and “internal disturbance”. One must note that though the 44th Amendment Act removed the words “internal disturbance” from the text of Article 352, and replaced it with “armed rebellion” yet the same has not been removed from the text of Article 355. The term “armed rebellion” is narrower in scope than “internal disturbance”. This means that a mere internal disturbance that falls short of an armed rebellion cannot justify a Proclamation of Emergency under Article 352, though it can justify an intervention of the Centre under Article 355. Further Article 356 talks about failure of constitutional machinery in the State. This means that mere “internal disturbance” does not justify a Proclamation under Article 356 unless it results in breakdown of constitutional machinery in the State [7]. This point has also been emphasized aptly in *S R Bommai vs. Union of India*[8], wherein Sawant J. for himself and on behalf of Kuldeep Singh J. has

observed, "Thus it is clear from Art. 355 that it is not an independent source of power for interference with the functioning of the State Government but is in the nature of justification for the measures to be adopted under Arts. 356 and 357. What is, however, necessary to remember in this connection is that while Art. 355 refers to three situations, viz., (i) external, aggression, (ii) internal disturbance, and (iii) non-carrying on of the Government of the States, in accordance with the provisions of the Constitution, Art. 356 refers only to one situation, viz., the third one. As against this, Art. 352 which provides for Proclamation of emergency speaks of only one situation, viz., where the security of India or any part of the territory thereof, is threatened either by war or external aggression or armed rebellion. The expression "internal disturbance" is certainly of larger scope than "armed rebellion". In other words, while a Proclamation of emergency can be made for internal disturbance only if it is created by armed rebellion; neither such Proclamation can be made for internal disturbance caused by any other situation nor a Proclamation can be issued under Art. 356 unless the internal disturbance gives rise to a situation in which the Government of the State cannot be carried on in accordance with the provisions of the Constitution. A mere internal disturbance short of armed rebellion cannot justify a Proclamation of emergency under Art. 352 nor such disturbance can justify issuance of Proclamation under Art. 356 (1), unless it, disables or prevents carrying on of the Government of the State in accordance with the provisions of the Constitution" [9].

Analysis of Article 355

In the Indian federation, 'law and order' has been designated to be a State subject. Thus the Centre's intervention under Article 355 would be justified only in cases of grave form of disturbance which is beyond the State's control. In practice, a convention has developed in India too, that the State Government will send a request to the Centre to send help. When a State makes such a request, then the Centre cannot refuse to extend help, in view of the specific obligation cast on the Centre by virtue of Article 355. Also, by reason of the phraseology of Article 355, it cannot also be said that the Centre can never intervene *suo motu*. Thus, the final decision in this regard seems to rest with the Centre [10]. The 42nd Amendment of the Constitution had added a new Article 257A into the Constitution, which enabled the Centre to deploy any armed forces of the Centre, or any other force under its control, for dealing with any grave situation of law and order in any State. Under this Article, the Centre could act without the concurrence of the concerned State Government. Some parallel changes were also incorporated in the legislative entries. Entry 2A was added to List I which reads, "Deployment of any armed force of the Union or any other force subject to the control of the Union or any contingent or unit thereof in any State in aid of the civil power; powers, jurisdiction, privileges and liabilities of the members of such forces while on such deployment". Consequent changes were also made in entries 1 and 2 of List II to exclude any such force from the purview of the States.

However, Article 257A gave birth to a good amount of controversy and was regarded by the States as an Article that eroded their autonomy. Hence the 44th Amendment Act repealed Article 257A. However, Entry 2A has still been retained in List I thus giving executive and legislative power to take necessary action to deploy armed forces in the State in aid of civil power. This power vested in the Centre can perhaps be justified with reference to Article 355. The fact that Article 352 permits the declaration of emergency in a part of the country because of armed rebellion means that the Centre has to take all possible steps necessary to maintain law and order in any part of the country if there is a serious breakdown thereof. It appears that even under Entry 2A, List I the Centre is entitled to deploy forces *suo motu* in a State to put down internal disturbance in a State and restore peace therein. If there is serious breakdown of law and order in a State the Centre will be justified to send its forces to meet the situation without receiving any request from the State for the same. This result emerges by reading entry 2A, List I, along with Article 355 [11].

Article 355 also stipulates another ground that justifies Centre's intervention in the State and that is, 'to ensure that the government of the State cannot be carried on in accordance with the provisions of the Constitution'. It is in fulfillment of this obligation that the Centre takes over the Government of a State (Article 356) in case of breakdown of the Constitutional machinery therein.

Shri H M Seervai makes an analysis of Article 355 [12]. He says that Article 355, by imposing a duty on the Union to secure that government of every State is carried on according to the provisions of the Constitution recognizes the right of every State to carry on the government according to the provisions of the Constitution. This right flows from the fact that the Constitution of India contains a Constitution both, for the Union and the States. But the right to carry on the government of the State is subject to a liability i.e. a State cannot carry on its government so as to bring about a failure of Constitutional machinery. Corresponding to the liability of the State is a power of the Union to ensure that in case of a failure of constitutional machinery in a State the government of a State is carried on according to the provisions of our Constitution. The power thus conferred, he says, is purposive, the purpose being to ensure that the government of the state must be carried on in accordance with the provisions of the Constitution. To make this power of the Union effective, Article 356 enables the President to impose what is generally known as the President's Rule. Given the purpose for which the power is conferred, any exercise of power designed to achieve a different purpose must be held to be invalid.

Sarbananda Sonowal Vs Union of India

The Supreme Court of India had engaged in the interpretation of Article 355 of the Constitution of India in the famous case of *Sarbananda Sonowal vs Union of India*. [13] This case is even otherwise an important one for a researcher on National Security. But before one can indulge in understanding the court's verdict in this case, it would be befitting to appraise the fact situation that gave birth to the controversy in the *Sonowal* case.

This case considered the problem of the large number of illegal migrants from Bangladesh, into the State of Assam. In the State of Assam, the Illegal Migrants (Determination by Tribunals) Act, 1983, for short called as the IMDT Act, was brought into force, especially to deal with the problem of the influx of foreigners who illegally migrated into India across the borders of the sensitive eastern and north-eastern regions of the country and remained in the country, thereby posing a threat to the integrity and security of the said regions. The Foreigners Act, 1946 was already in force in the country which dealt with foreigners in India and the Central government had also passed the Foreigners (Tribunals) Order, 1964 in pursuance of the powers given under the Act. The Act and the Order together laid down a procedure for the detection and deportation of foreigners who had entered into India and continued to stay here without lawful authority to do so. However in the State of Assam, the IMDT Act was brought into force which was given an overriding effect over the other enactments operating in this field. Under Section 3(1)(c) of the IMDT Act, an illegal migrant was defined as a person with respect to whom three conditions must be satisfied, namely, (i) he has entered India on or after 25th March, 1971; (ii) he is a foreigner which means he is not a citizen of India; and (iii) he has entered India without being in possession of a valid passport or other travel documents or any other lawful authority in this behalf. Therefore, if a foreigner had entered India on or after 25th March, 1971, he would be dealt with under the IMDT Act, whereas a foreigner who has entered any part of India including Assam before 25th March, 1971, would be dealt with under the Foreigners Act. Section 4 of the IMDT Act was an overriding provision which laid down that the IMDT Act or the Rule or order made therein shall have effect notwithstanding anything contained in the Foreigners Act, 1946 or the Immigrants (Expulsion from Assam) Act, 1950 or the Passport Act or any Rule or Order made thereunder. Section 8(1) conferred power on the Central Government to make a reference to the Tribunal to decide whether any person is an illegal migrant. This reference could also be made on a representation by an illegal migrant against

any order passed against him under the Foreigners Act not to remain in India. This provision gave special advantage to an illegal migrant in Assam, which was not available to any foreigner in rest of India. Section 8(2) provided that any person may make an application to the Tribunal whether any person whose name is given in the application is or is not an illegal migrant but the proviso to this sub-section imposed a restriction that such an application could be given only by a person who lived within the jurisdiction of the same police station in which the alleged illegal migrant was found or resided. Section 8(3) imposed some further conditions and restrictions, namely, that the application shall be accompanied by affidavits sworn by not less than two persons residing within the jurisdiction of the same police station in which the alleged illegal migrant was found or was residing and a Court Fee of Rs.10/- had to be paid. Section 8-A laid down that any person may make an application to the Central Government for decision by a Tribunal as to whether the person whose name and other particulars are given in the application is or is not an illegal migrant. In view of sub-section (2) of this Section, the application had to be accompanied by a declaration by another person residing within the jurisdiction of the same revenue sub-division in which the applicant resided and further conditions were imposed that no person shall make more than ten such applications or more than ten such declarations. The Central Government could, after making such inquiry, as it deemed fit, reject the application on the ground that it was frivolous or vexatious. In view of the language used in Section 14 there was no right of appeal against such an order as right of appeal was conferred only against an order passed by the Tribunal under Section 12. The order of rejection of the application would enure to the benefit of the alleged illegal migrant and there being no right of appeal it would attain finality making him safe and secure. If the Central Government made a reference it would only initiate the proceedings before the Tribunal causing no immediate prejudice to the illegal migrant and if the Tribunal ultimately held against him, he would have a right of appeal to the Appellate Tribunal. It is also pertinent to note that the IMDT Act contained no analogous provision about the burden of proof as was there in the Foreigners Act. Section 9 of the Foreigner's Act 1946 casts the burden of proving that a person is not a foreigner or is not a foreigner of such particular class or description, as the case may be, upon such person. The Constitutional validity of the IMDT Act and the rules and order passed thereunder were challenged by the petitioner in the instant case.

It was the contention of the petitioner that the procedure provided under the Act was a cumbersome, time consuming and an extremely difficult one, which made it practically impossible to detect and deport the illegal migrants from India. The petitioner thus made out a case that the IMDT Act and the Rules made thereunder in fact serve to shelter and protect the illegal migrants rather than to identify and deport them. The result of the IMDT Act, according to the petitioner was that, there were a number of non-Indians, who surreptitiously entered into Assam after March 25, 1971 without possession of valid passport, travel documents or other lawful authority to do so, and they continued to reside in Assam. Their presence had changed the whole character, cultural and ethnic composition of the area and posed a threat to the security thereof.

Notice some important observations of the court in connection with a discussion about Article 355 of the Constitution. "The Preamble of the Act says that 'the continuance of such foreigners in India is detrimental to the interests of the public of India.' The Governor of Assam in his report dated 8th November, 1998 sent to the President of India has clearly said that unabated influx of illegal migrants of Bangladesh into Assam has led to a perceptible change in the demographic pattern of the State and has reduced the Assamese people to a minority in their own State. It is a contributory factor behind the outbreak of insurgency in the State and illegal migration not only affects the people of Assam but has more dangerous dimensions of greatly undermining our national security. Pakistan's I.S.I. is very active in Bangladesh supporting militants in Assam." [14] The court further remarked, "Bangladesh is one of the world's most populous countries having very few industries. The economic prospects of the people in that country being extremely grim, they are too keen to cross over the border and occupy the land

wherever it is possible to do so. The report of the Governor, the affidavits and other material on record show that millions of Bangladeshi nationals have illegally crossed the international border and have occupied vast tracts of land like "Char land" barren or cultivable land, forest area and have taken possession of the same in the State of Assam. Their willingness to work at low wages has deprived Indian citizens and specially people in Assam of employment opportunities. This, as stated in the Governor's report, has led to insurgency in Assam. Insurgency is undoubtedly a serious form of internal disturbance which causes grave threat to the life of people, creates panic situation and also hampers the growth and economic prosperity of the State of Assam though it possesses vast natural resources. This being the situation there can be no manner of doubt that the State of Assam is facing "external aggression and internal disturbance" on account of large scale illegal migration of Bangladeshi nationals. It, therefore, becomes the duty of Union of India to take all measures for protection of the State of Assam from such external aggression and internal disturbance as enjoined in Article 355 of the Constitution"[15].

New Horizons of 'External Aggression'

The term "external aggression" was discussed at considerable length in this judgment of the Supreme Court. This judgment throws vivid light on the different meanings accorded to the term "aggression" as used in Article 355. One must bear in mind that Article 355 uses the words "external aggression" but not "war" as employed in Article 352. Towards this end notice the different definitions of the concepts as considered by the court. It observed, "The word 'aggression' is not to be confused only with 'war'. Though war would be included within the ambit and scope of the word 'aggression' but it comprises many other acts which cannot be termed as war. In *Kawasaki v. Bantahm S.S. Company*, 1938 (3) All ER 80, the following definition of 'war' as given in Hall on International Law has been quoted with approval :

'When differences between States reach a point at which both parties resort to force, or one of them does acts of violence, which the other chooses to look upon as a breach of the peace, the relation of war is set up, in which the combatants may use regulated violence against each other, until one of the two has been brought to accept such terms as his enemy is willing to grant.'

In Introduction to International Law by J.G. Starke (Chapter 18) it is said that the war in its most generally understood sense is a contest between two or more states primarily through their armed forces, the ultimate purpose of each contestant or each contestant group being to vanquish the other or others and impose its own conditions of peace. With the passage of time, the nature of war itself has become more distinctly clarified as a formal status of armed hostility, in which the intention of the parties, the so-called *animus belligerendi* may be a decisive factor. The modern war may involve not merely the armed forces of belligerent states but their entire population. In *Essays on Modern Law of War* by L.C. Green the author has said that in accordance with traditional international law, "war is a contention between two or more States through their armed forces, for the purpose of overpowering each other and imposing such conditions of peace as the victor pleases." [16]. The Court further emphatically remarked that 'the framers of the Constitution have consciously used the word 'aggression' and not 'war' in Article 355'.

Article 1, Chapter 1 of the UN Charter makes use of the phrase 'acts of aggression'. In this context, the International Law Commission has defined the term aggression as any act of aggression including the employment of armed forces by a State against another State for any purpose other than national or collective self-defence or any decision by a competent organ of the United Nations. But at the 1954 Assembly, there was opposition to this definition. In his book *Conflict through Consensus* by Julius Stone (1977 Edn.), the author has described in great detail how after twenty years of discussion by a Special Committee on "aggression" a consensus was arrived at and an agreed definition was approved by the United Nations Assembly on 12th April, 1974 vide Resolution No.3314 (XXIX). The Soviet Union

pressed for inclusion of "ideological aggression" and also "the promotion of the propaganda of fascist-nazi views, racial and national exclusiveness, hatred and contempt for other peoples." Iran pressed for inclusion of "indirect aggression, of intervention in another State's internal or foreign affairs", including "direct or indirect incitement to civil war, threats to internal security, and incitement to revolt by the supply of arms or by other means.". Many States wanted the definition to include "economic aggression". Shri M. Jaipal of India advocated that in view of "modern techniques of coercion" the definition of aggression should have included "economic pressures" and "interventionary and subversive operations." (See page 97 of the book) Julius Stone has quoted the following comments of Charles de Visscher, on the notion of aggression : "aggression, in the present state of international relations, is not a concept that can be enclosed in any definition whatsoever : the finding that it has occurred in any concrete case involves political and military judgments and a subjective weighing of motives that make this in each instance a strictly individual matter." Rapporteur Spiropoulos explained to the International Law Commission that a determination of aggression "can only be given in each concrete case in conjunction with all constitutive elements of the concept of the definition". According to the author what needs also to be kept in mind is that this is precisely because the "aggression" notion is a fact value complex of such vast range. (See pages 108-109 of the book). Therefore, "aggression" is a word of very wide import having complex dimensions and would to a large extent depend upon fact situation and its impact[17].

Further, the judgment also considered an interesting statement made by Dr. Nagendra Singh, India's representative in the Sixth Committee of the General Assembly on the definition of aggression, when there was a large scale influx of persons from the then East Pakistan into India before the commencement of December 1971 Indo-Pak war. He said, "The first consideration, in the view of the Indian Delegation, is that aggression must be comprehensively defined. Though precision may be the first virtue of a good definition, we would not like to sacrifice the requirement of a comprehensive definition of aggression at any cost. There are many reasons for holding this view. Aggression can be of several kinds such as direct or indirect, armed in nature or even without the use of any arms whatsoever. There can be even direct aggression without arms..... We would accordingly support the categorical view expressed by the distinguished delegate of Burma, the U.K. and others that a definition of aggression excluding indirect methods would be incomplete and therefore dangerous.

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.....

For example, there could be a unique type of bloodless aggression from a vast and incessant flow of millions of human beings forced to flee into another State. If this invasion of unarmed men in totally unmanageable proportion were to not only impair the economic and political well-being of the receiving victim State but to threaten its very existence, I am afraid, Mr. Chairman, it would have to be categorized as aggression. In such a case, there may not be use of armed force across the frontier since the use of force may be totally confined within one's territorial boundary, but if this results in inundating the neighboring State by millions of fleeing citizens of the offending State, there could be an aggression of a worst order..... What I wish to convey, Mr. Chairman, is the complexity of the problem which does not permit of a four-line definition of aggression much less an ad interim declaration on it." [18] This shows that the stand of our country before the U.N.O. was that influx of large number of persons from across the border into India would be an act of aggression. Thus a very broad meaning of the term aggression seems to have been accepted and this would be a crucial factor in determining the situations where Central intervention can be justified under the scheme of Article 355 of the Constitution.

The court adopted a comparative approach between the Foreigners Act and the IMDT Act. It further remarked, "there cannot be even a slightest doubt that the application of the IMDT Act and the Rules made thereunder in the State of Assam has created the biggest hurdle and is the main impediment or barrier in identification and deportation of illegal migrants. On the contrary, it is coming to the advantage of such illegal migrants as any proceedings initiated against them under the said provision which, as demonstrated above, almost entirely ends in their favour, enables them to have a document having official sanctity to the effect that they are not illegal migrants. As already discussed, the presence of such a large number of illegal migrants from Bangladesh, which runs into millions, is in fact an "aggression" on the State of Assam and has also contributed significantly in causing serious "internal disturbances" in the shape of insurgency of alarming proportion making the life of the people of Assam wholly insecure and the panic generated thereby has created a fear psychosis"[19]. These observations are interesting as they lead us to the conclusion that influx of illegal migrants has been read to be a part of "aggression" within the meaning of Article 355.

Further, the Parliament had enacted the Immigrants (Expulsion from Assam) Act, 1950 to deal with the serious situation that had arisen from the immigration of a very large number of East Bengal residents into Assam. However, on account of Section 4 of the IMDT Act the Immigrants (Expulsion from Assam) Act, 1950 had been superseded and the provisions of the said Act had ceased to apply to the State of Assam. Thus the court observed that by enacting the IMDT Act the Parliament has divested the Central Government of the power to remove migrants from Bangladesh, whose presence was creating serious law and order problem, which fact had been realized by the Central Government as early as in 1950. The IMDT Act, instead of maintaining peace had only revived internal disturbance. Another important enactment, whose provisions had been superseded by Section 4 of the IMDT Act, was The Passport (Entry into India) Act, 1920. Thus in view of this, the court noted, "Section 4 of the IMDT Act has stripped the Central Government of its power of removal of such person from India and also the power of arrest of such person without warrant possessed by a police officer of the rank of Sub-Inspector or above. The above discussion leads to irresistible conclusion that the provisions of the IMDT Act and the Rules made thereunder clearly negate the Constitutional mandate contained in Article 355 of the Constitution, where a duty has been cast upon the Union of India to protect every State against external aggression and internal disturbance. The IMDT Act which contravenes Article 355 of the Constitution is, therefore, wholly unconstitutional and must be struck down"[20]. Thus it is interesting to note how Article 355 of the Constitution was used as a parameter by the court to invalidate the IMDT Act. Further, the Act was also held violative of Article 14 of the Constitution since the court was of the opinion that it was not enough to keep only the geographical factor in mind in making a classification[21].

The ultimate conclusion of the court was thus, " To sum up our conclusions, the provisions of the Illegal Migrants (Determination by Tribunals) Act, 1983 are ultra vires the Constitution of India and are accordingly struck down. The Illegal Migrants (Determination by Tribunals) Rules, 1984 are also ultra vires and are struck down. As a result, the Tribunals and the Appellate Tribunals constituted under the Illegal Migrants (Determination by Tribunals) Act, 1983 shall cease to function. The Passport (Entry into India) Act, 1920, the Foreigners Act, 1946, the Immigrants (Expulsion from Assam) Act, 1950 and the Passport Act, 1967 shall apply to the State of Assam. All cases pending before the Tribunals under the Illegal Migrants (Determination by Tribunals) Act, 1983 shall stand transferred to the Tribunals constituted under the Foreigners (Tribunals) Order, 1964 and shall be decided in the manner provided in the Foreigners Act, the Rules made thereunder and the procedure prescribed under the Foreigners (Tribunals) Order, 1964." [22]

Concluding Comments

The decision in *Sarbananda's* case raises deeper questions about the relationship of judiciary and the executive in the area of federalism. One might argue that the Court's declaration of the invalidity of the IMDT Act by the application of the substantive review of the executive and legislative judgment to enact the IMDT Act is a gross violation of the doctrine of separation of powers. It might be argued that the nature of intervention and the extent of intervention in the affairs of the state is a legislative judgment and therefore the court ought not to interfere with it by substituting its own judgment about the efficacy or otherwise of the measures adopted by the Union. Furthermore, immigration is a foreign policy issue, where the nation must speak with one voice. The Court's adoption of a conflicting perspective is extremely undesirable.

On the other hand, the *Sarbanand* case represents a liberal approach of the court in strengthening the hands of the Union government to come to the rescue of the States. In the context of the federal principle, where the court intervenes to strengthen the hands of the Union government vis-à-vis the States, it is neither acting contrary to the doctrine of separation of powers, nor acting contrary to the principles of federalism. In construing the obligation of the federal government under Article 355 to rescue the states from war or external aggression in a liberal manner is a welcome development in the area of Constitutional jurisprudence. It is submitted that the liberal interpretation of the expression "external aggression" is mandated by the circumstances in which the State found itself. Therefore the *Sarbananda* decision should serve as a reminder to be vigilant in guarding the borders of the State[23]. Also this liberal approach presents a fascinating example of the court's endorsement of the modern concept of national security, or atleast an expansion in the classical concept, as it includes something more than the physical dimension of security. The manner in which the court chose to interpret 'external aggression' in this case was indeed expansive as well as innovative. It constitutes a glaring departure from the notion of aggression that was hitherto understood and employed. It did not keep this terminology restricted to some form of physical attacks but construed the influx of illegal immigrants to constitute an aggression/attack upon the cultural ethos of the state of Assam. Hence this case assumes a place of unshaken significance for a study of the shift in the paradigm of national security. Not only has the notion of national security undergone a massive change from classical to the modern concept, wherein it now includes all the 'well-being' aspects within the compass of the term, but this case demonstrates how the classical notion of national security has also witnessed a change. In defining the paradigm of physical security, the court has looked far beyond the mere possibility of physical attacks that jeopardize national security. Hence this case serves as an illuminating example of the change in the traditional/classical idea of national security.

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- [23]. See also *SR Bommai vs Union of India* strengthening the hands of the Union government for protecting Secularism as the part of the basic structure of the Constitution. See also *Luther vs Borden* where the court had to consider the question whether the democratic rebel or the colonial government was a legitimate government of Rhode Island was a political question. On merits, the court held that that the temporary declaration of martial law by the colonial government was constitutional.
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Analysis of the Concept of Constitutional Morality within the Dynamics of Deliberative Democracy

Varsha Deshpande¹

Introduction

The concept of Constitutional morality is gaining ground in contemporary times in India and the court has used this concept in some of its recent noteworthy judgments². Though the Constituent Assembly Debates do contain scattered references to constitutional morality in the speeches of Dr Ambedkar³, this term lay into dormancy thereafter and was never used as a standard by the courts, until only recently. In contemporary times however one notices a sudden upsurge in the Court's repeated invocation of this principle for adjudication of some of the contentious issues that were tabled before it. The fact that the rather fluid concept of constitutional morality is now forming the basis for guiding the decisions of Indian courts, it has thereby opened up space for constitutional researchers to explore what the contents and contours of this concept are. It is an inviting project to analyse the historical references to constitutional morality, to attempt a delineation of some minimum content thereof and in that backdrop, to evaluate its recent invocation by the Indian judiciary. This is the precise study that the present paper attempts to undertake.

Meaning of Constitutional Morality

A. Historical references to Constitutional Morality:

As a starting point, the discourse on constitutional morality in the Indian context commences with the famous speech of Dr Ambedkar⁴ where he is seen using this concept in the context of pressing on the need to include the details of administration within the Constitutional text. However when Ambedkar uses constitutional morality here, he makes further back references

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² See for example *Naz Foundation vs Govt of NCT* 2009, SCC OnLine Del 1762; *Navtej Singh Johar vs UoI*, (2018) 10 SCC 1; *Indian Young Lawyers Association and Others vs State of Kerala and others*, (2019) 11 SCC 1 etc.

³ VII, Constituent Assembly Debates, Official Reports, 4th Nov 1948, 38

⁴ *Ibid*

to George Grote's rendition of this principle in his *History of Greece*⁵. Both of them present us with a formulation of constitutional morality which is meta-legal. However, the purposes for which both of them invoked constitutional morality were distinct. While Grote's concerns centered on a zealous *preservation* of Athenian democracy, Dr Ambedkar's concerns reeled around the prior act of *establishing* democracy in the first place, in a society which he believed, is inherently undemocratic⁶. When the Founding Fathers framed a Constitution for India, their concern was not merely confined to the one-time act of framing the constitution; the underpinning concern rather was the creation of a grammar of constitutionalism in India. Ambedkar's invocation of constitutional morality has to be understood in this light. Pratap Bhanu Mehta, in his incisive analysis of Ambedkar's idea of constitutional morality, points to some of its very essential elements in his formulation. These are "self-restraint, respect for plurality, deference to processes, scepticism about authoritative claims to popular sovereignty, and the concern for an open culture of criticism that remains at the core of constitutional forms"⁷. And constitutional morality meant "a paramount reverence to these constitutional forms"⁸. It referred to "a set of adverbial conditions to which agents in a constitutional setting must subscribe"⁹. These logically coherent elements which Mehta scans for us, help in somewhat outlining the otherwise fuzzy concept of constitutional morality.

If one studies the project of framing of India's constitution, one notices that the Constituent Assembly perhaps was the highest epitome of reverence to constitutional morality. The proceedings before the Assembly resound a thundering manifestation of what Ambedkar meant by constitutional morality. Amidst fierce disagreements between members of the Assembly, one notices the profound respect that each one had for the other and for each other's views. The floor of the Assembly was the site on which respect for

⁵ G. Grote, *A History of Greece: From the Time of Solon to 403 B.C.* 93, Condensed and Edited by J.M. Mitchell and M.O.B. Caspari, Routledge, London and New York, 2001.

⁶ Ambedkar, 'Speech Delivered on 25 November 1949' in *The Constitution and Constituent Assembly Debates*, p. 174.

⁷ Pratap Bhanu Mehta, 'What is Constitutional Morality', *Seminar* 615, November 2010, available at www.india-seminar.com › 615_pratap_bhanu_mehta (last visited on 6th Feb 2020)

⁸ *Supra* note 2

⁹ Sujit Chaudhary, Madhav Khosla (*et al. eds*), *Oxford Handbook of Indian Constitution*, Locating Indian Constitutionalism, Oxford University Press 2016, 45

plurality of opinions and an open culture of criticism flourished at its best. It created spaces for questioning as well as for dissent. Thus the Constituent Assembly embodied the tenets of constitutional morality outlined above and was a living example of what a deliberative democracy stands for.

B. Use of Constitutional Morality by the Courts

After the Constitution of India came into force, one does not see much explicit reference, and definitely not any reliance, on the principle of constitutional morality by the Indian judiciary, for adjudication of issues brought before it. This trend of seeking some guidance from constitutional morality becomes visible only recently; more particularly from the *Naz Foundation* case onwards. Some of the recent judgments of the Indian courts, seem to pull out the concept of constitutional morality from the cupboard, wherein it probably lay for all the years after Dr Ambedkar made reference to it. But one distinction between its invocation by the Founding Fathers during the framing of the Constitution as against its recent invocation by the Indian judiciary is noteworthy; namely the distinction in the frame of reference. The Constituent Assembly was framing a Constitution for a democratic state that was to come into being with the commencement of this Constitution. Hence their concerns were all macro-level concerns. Though an individual figured as an important entity in the minds of the framers generally, yet they were not looking at any specific concerns of individual like the court was, in the recent cases. The courts in India were required to address some specific concerns/issues about certain individuals/groups that were presented to it, and it is in those specific contexts, that the court is seen relying on the notion of constitutional morality. This frame of reference was completely different in case of the Constituent Assembly.

In contemporary times, the *Naz Foundation*¹⁰ case gave currency to the idea that constitutional morality could form a valid basis for the court to arrive at a decision. In deciding a challenge to the constitutional validity of Section 377 of the Indian Penal Code, insofar as it applies to consenting homosexual adults in private, the court draws a clear distinction between popular morality on one hand and constitutional morality on the other. It

¹⁰ *Naz Foundation vs Govt of NCT 2009, SCC OnLine Del 1762*

clearly says that between popular morality and constitutional morality, the court would not only be guided by the latter but that the court is also duty bound to act as a custodian to uphold it. Hence even in the face of society's disapproval of homosexual individuals as another form of human diversity or as co-equal members of the human society, the court saw in itself a duty to uphold constitutional morality, that includes respect for plurality and diversity. In *Naz*, the court did not indulge into the exercise of identifying the substantive content of constitutional morality, but it certainly gets the credit of inaugurating a new trend in constitutional adjudication; the trend of relying upon the concept of constitutional morality for the determination of some valuable claims of individuals that were striving for recognition before the courts. It used constitutional morality as a determinable standard for deciding whether there was a compelling state interest or not.

In *Manoj Narula*¹¹ the court was called upon to decide on the correctness of the appointment of certain ministers in the Union Cabinet who were being tried for certain grave charges that involved moral turpitude. The Supreme Court, in holding these appointments as bad, took recourse to the principle of constitutional morality. The court opined that constitutional morality works at the fulcrum and guides as a laser beam in institution building. It emphasized that constitutional morality requires bowing down to the norms of the constitution and that it is necessary for people at large as well as persons incharge of institutions to respect these norms¹². On a closer scrutiny it appears that the idea of constitutional morality as expressed by the court in this case, lines up with Mehta's analysis of this concept. Constitutional morality again figured into discussion in *State (NCT of Delhi) vs UOI*¹³, where the Supreme Court reminds yet again that this principle demands a strict adherence to all constitutional principles contained in different segments of the constitution and that it is very essential for every member of the polity, whether ordinary citizens or high constitutional functionaries to idolize constitutional fundamentals¹⁴.

¹¹ *Manoj Narula vs Union of India* (2014) 9 SCC 1

¹² *Ibid* 49, para 75

¹³ (2018) 8 SCC 501

¹⁴ *Ibid*, 573, para58

Later in 2018 in *Navtej Singh Johar and Others vs Union of India and Others*¹⁵ when the Supreme Court of India got another opportunity to reconsider the issue of homosexuality under Section 377 of the Indian Penal Code, one notices a robust reliance on the principle of constitutional morality. Justice Deepak Misra's exposition of constitutional morality depicts at least four startling features. First, he chose to see constitutional morality as a means for realizing constitutionalism¹⁶. He believes that the Preamble goals of Justice, Equality, Liberty and Fraternity can only be achieved through the loyalty of the organs of the state to the principles of Constitutional morality. Second, his repeated emphasis lay specifically on constitutional morality being observed and practiced by *officials of the state*, as opposed to citizens. He said that while the constitution guaranteed some inalienable rights to the citizens to facilitate their development, it also sought to ensure that the *three organs of the state* 'practise' and 'stay alive to the concept of constitutional morality'¹⁷. While agreeing with Dr Ambedkar that constitutional morality was not a natural sentiment in us by virtue of our domination by a foreign power back then, he however locates a duty in the organs of the state, including the judiciary, to strengthen the fabric of constitutional morality in contemporary India. Third, he is seen using constitutional morality to emphasize how pluralism and diversity have formed the basis of our constitutional culture. Hence constitutional morality obligates the state to assume the responsibility for the creation of an eco-system in which asymmetrical attitudes are allowed to sustain. On this view, constitutional morality becomes diametrically opposed to any attempts to shove homogeneity in society. Fourth, he joins company with Naz in drawing a clear distinction between popular/social morality and constitutional morality and also in according a clear primacy to the latter in deciding causes before the court. According to him, the concept of constitutional morality would serve as an aid for the court to arrive at a just decision. This further concretized the idea that was floated by Naz that constitutional morality furnishes the court with yet another parameter for deciding validity of legislation. The culmination of this is seen in the following observation of J.

¹⁵ (2018) 10 SCC 1

¹⁶ Id 105

¹⁷ Id 106

Deepak Misra: “While testing the constitutional validity of impugned provision of law, if a constitutional court is of the view that the impugned provision falls foul to the precept of constitutional morality, then the said provision has to be declared as unconstitutional for the pure and simple reason that the constitutional courts exist to uphold the Constitution”¹⁸.

As a contrast to this version, Chandrachud J. in his judgment speaks about the need for *citizens* (as against only officials of the state) to imbibe constitutional morality consistently and continuously¹⁹. He seems to gather the contents of constitutional morality from the ideals set out in the Preamble and the paramountcy that must be accorded to these values. Constitutional morality, according to him, is the means for achieving the transformation which the Indian Constitution envisages. But because the process of imbibing constitutional morality in society is gradual, he says that it is the duty of the constitutional courts to act as ‘external facilitators’ and to be ‘a vigilant safeguard against excesses of state power and democratic concentration of power’²⁰. Hence monitoring the preservation of constitutional morality, under this analysis, is seen as sacrosanct duty of the court. The learned judge emphasises on the counter-majoritarian role of the judicial institution in the protection and preservation of constitutionally entrenched rights regardless of what the majority may believe.²¹ He validly places reliance on Dr Ambedkar’s ideas of social reform wherein he highlights the importance of giving space to individuals for asserting against group ideologies: “The assertion by the individual of his own opinions and beliefs, his own independence and interest – over and against group standards, group authority and group interests – is the beginning of all reform. But whether the reform will continue depends upon what scope the group affords for such individual assertion”²². This observation seems particularly relevant for guiding the court to decide the issue at hand in *Navtej Johar*. Similarly, in *Sabarimala*²³ case, there was again a reliance on constitutional morality. Chief Justice Deepak Misra as well as Chandrachud J. equated the word

¹⁸ Id 108

¹⁹ Id 284,285

²⁰ Id 286, Para 601

²¹ Id 288, Para 608

²² As cited in *Governemnt of NCT of Delhi vs UoI 2018(8)SCALE 72*, at para 12.1

²³ *Indian Young Lawyers Association and Others vs State of Kerala and others*, (2019) 11 SCC 1

'morality' in the text of Art 25 of the Indian Constitution with constitutional morality. Such a formulation of constitutional morality clearly places legitimacy in the courts to speak a language different from the shared morality of the society; to allow constitutional principles and values to triumph over popular perceptions of good and bad. This judgment gives a clear message that society cannot dictate the expression of sexuality. Thus the courts hereby assume a vast transformative potential to even bring in social reforms, which conventionally speaking, has been the domain of the representative legislatures.

Operationalizing Constitutional Morality through Transformative Constitutionalism

Any discourse on transformative constitutionalism is premised on the thesis that Constitutions are meant to be enduring documents. The aspirations of the founding fathers of Indian Constitution, derivable directly from their engagement in the freedom struggle, got pinned on the pages of the Constitutional text. However they were not meant to remain there for resolving the issues or concerns of the people of those times only; they helped sketch the broader vision behind this monumental document. The Founding fathers saw this Constitution as a bridge to connect our moments of history with its envisioned future. Built upon injustices of the past, there was a very specific dream of a future that was captured within the covers of the Constitutional text. Clearly therefore, constitution writing was never meant to be a short-term project confined to the needs of that particular time only. It was rather always meant to be an enduring code that could evolve, adapt and accommodate all that was envisioned at the moment of its framing, as also all that was not. It was always supposed to be a constitution that could help address the diverse concerns of people for all times to come. If this thesis be accepted then the task of constitutional interpretation assumes vibrancy. It remains a powerful tool at our disposal to prevent the rusting and eventual decay of the constitution occasioned by stagnancy. Constitutional interpretation must be infused with dynamism to make constitution a living document and one of unfading vitality. It is here that transformative constitutionalism becomes relevant. Constitutional history and Assembly Debates help judges glean some semblance of insights about both, the

contextual specificities that led to the incorporation of a particular provision in the text as also the general tone of the constitution. In Constitutional adjudication, judges have to keep both of these in mind. While the historical specificity cannot be ignored, the general tone of the Constitution cannot be lost sight of either. Judges must be able to accommodate contemporary issues within this frame through dynamic interpretation. Only then can courts become the bridge to connect our history to our future. A brilliant example of this is furnished by J Chandrachud's invocation of Art 17 in *Sabarimala*²⁴ in the context of ban on women's entry into temples. While the historical specificity of its application to Dalits was not lost sight of, the learned judge chose to extend its application to exclusion of menstruating women also, since both exclusions were founded on notions of pollution and purity. Such an interpretation helped uphold the inclusive tone of our Constitution.

Legislations are an embodiment of the majoritarian voice. Hence they are often structured upon the silencing of individual narratives. They often ignore the substantive disadvantages faced by individuals. This disadvantaged class then finds a refuge in the judicial institution to address these disadvantages by adopting an interpretation that is no doubt, guided by the past, but alive to needs of the present and future. The judiciary has the facility, if need be, to go even against popular sentiment, which legislatures will rarely do. Hence transformative constitutionalism equips the courts with an avenue for addressing these specific disadvantages faced by individuals or groups. The judges would have to be always in search of newer principles and doctrines to ensure that Constitutions keep pace with changing times. One such principle that the judiciary has re-invented in the recent times is the principle of constitutional morality. This principle has been operationalised through transformative constitutionalism.

In *Naz Foundation* and *Navtej Singh Johar*, constitutional morality triumphed over public morality and served as a foundation for the decriminalization of homosexual associations. In *Sabarimala* it operated as an immortal principle for throwing open the doors of the said temple to women in the age of 10 to 50 years who were hitherto excluded. In *Shayara Bano*, it

²⁴ Ibid

came in aid for declaring the customary practice of triple talaq unconstitutional and in Joseph Shine it helped do away with an abhorrent provision like adultery in our criminal law. None of these results could have been easily achievable through legislative initiative alone. But the judiciary, through transformative constitutionalism, could invoke constitutional morality and not just hear individual narratives but also undo the injustices that certain individuals or classes had suffered for long. As a contrast to this if we look at the American case of *Bowers vs Hardwick*²⁵, the American Supreme Court was found distancing itself from the lived experiences of homosexuals in that society. This lapse in this judgment was corrected by the court subsequently in *Lawrence vs Texas*²⁶.

If one views the history of constitutional adjudication in India, it becomes clear that Maneka Gandhi onwards is marked as an era of creative interpretation of the constitution. The post-Maneka period heralded an age of 'unenumerated rights'. This was a new strategy adopted by the courts to address the diverse issues that were brought before it. However, the strategy of unenumerated rights differs significantly from the strategy of using constitutional morality. While the former's focus lay on the creation of a new right, the latter was used for the removal of specific substantive disadvantages. The judicial coinage of a right may or may not be of immediate help for addressing a particular concern. So for example when a court of law says that right to food is a fundamental right²⁷, saying so did not per se ensure that every individual gets food. At best, it only served as a significant milestone to lead to the enactment of the National Food Security Act, several years after the right to food was coined. However when the court used constitutional morality as a ground for de-criminalizing homosexuality or adultery, or for lifting the years old ban on entry of women into temple, the specific disadvantages on individuals or groups were immediately removed. This is an important distinction between the two different strategies of the court. By building into the Constitution, certain meta-ethical dimensions, the SC has found a new insight to interpret and apply provisions of the

²⁵ 1986 SCC OnLine US SC 165

²⁶ 2003 SCC OnLine US SC 73

²⁷ PUCL vs Union Of India AIR 2004 SC 456

Constitution that go much beyond the theory of integrated reading of the Constitution as sanctioned by the *Maneka Gandhi*²⁸ case. By adopting meta-ethical concepts, the courts have built upon the notion of constitutional morality and developed a tool for fighting majoritarian political battles.

The Use of Constitutional Morality and Deliberative Democracy

Several objections surround the use of constitutional morality by the courts. First is the fluid nature of the concept. Many argue that it is necessary to devise some logically coherent methodology to define the exact content thereof²⁹. Else, we run the risk of individual discretion of judges reflecting as constitutional morality. A second possible objection can be that constitutional morality is applied and realized through courts. But judicial process is not designed to carry out fundamental social and political reforms but to develop the law in an incremental manner. Furthermore, the judicial institutions and processes are de-limited by the kinds of parties which can be represented before a court thereby striking at the very root of deliberative democracy and processes which alone can legitimize the exercise of political power in this context.

However it is important to realize that channels of deliberative democracy are often blocked by cultural temperaments and biases. Such biases would never allow certain issues to be ever deliberated upon, as they run the risk of political parties becoming unpopular. No platform is thus available for discussion on such issues. The social and cultural biases against homosexuality for example, could never foster the recognition of the dignity and equality claims of homosexuals through the deliberative process. The criminalization of homosexuality since the enactment of the Penal Code till as late as the year 2018 bears testimony to this fact. The least that judicial intervention in this arena has served was to atleast bring the issue on the landscape of public discussion in the first place and then eventually to bring the matter high up on state agenda. Hence constitutional morality contributed to de-constructing the taboo surrounding homosexuality. By de-criminalizing homosexual associations, the judiciary has set the ball in motion, which

²⁸ *Maneka Gandhi vs. UoI* AIR 1978 597

²⁹ Surabhi Shukla, *Constitutional Morality in the Indian Constitution*, available at law.ox.ac.uk, (last visited on 2nd February 2020)

hopefully will culminate in legalization thereof through laws that will recognize their rights. It will, sooner or later, foster some thinking and deliberation in Parliament on this issue. But such legislative initiative without prior judicial intervention would have been impossible owing to cultural biases. In this sense then, constitutional morality cannot be seen as antithetical to deliberative democracy; it rather facilitates deliberative democracy.

Conclusion

The aforesaid discussion makes it clear that the concept of constitutional morality refers to certain overarching values that seek to define the basic nature and spirit of the constitution. Hence what is demanded of both, citizens as well as Constitutional functionaries is a reverence to these overarching values. While it is absolutely non-negotiable to respect the specific expectations revealed from the text of the Constitutional provisions, it is equally important that in operationalizing the constitutional text, the underlying spirit and values of the constitution are never allowed to be lost sight of. In that sense, constitutional morality operates as a guiding principle or norm to help judges fashion their interpretation in the light of these indispensable values. Thus in *Navtej Johar* for example, the Court did arrive at a finding of violation of specific fundamental rights under Articles 14, 15 and 21 for example. But the court's repeated reiteration of the fact that our Constitution celebrates diversity and that it is one that respects plurality and heterogeneity served well to recognize that homosexuals are just another form of human diversity, worthy of an equal membership of the human community. This was the underlying value of our constitution that triumphed ultimately. Thus constitutional morality has furnished the judicial institution with a tool to safeguard those values which the Constitution holds dear.

However, these initiatives which the judiciary has indulged into, will have to be further endorsed through the deliberative process in Parliament, to make them complete. So for example, the judicial initiative in decriminalization of homosexuality will be of real meaning when this process culminates into a legislative law that legalizes the same, by recognizing concrete rights of homosexuals like those pertaining to marriage, adoption

etc. Right now only the stigma attached to homosexuality has been removed. But they cannot get effective and equal membership in society without recognition of their rights. Hence the whole process can be complete only when the initiative of the judiciary is met with equal co-operation by the legislative branch. The legislatures will not just have to engage in the deliberative process for enactment of a law but will have to ensure that the law is coherent with the line of development brought about by the judiciary. The *Shayara Bano*³⁰ case struck down the abhorrent practice of triple talaq. This judgment was a great milestone in ensuring to Muslim women their freedom from the arbitrary will of their husbands. Towards that end, it was a move to bringing about their empowerment. But when the legislature enacted the Muslim Women (Protection of Rights on Marriage) Act, 2019 and made the practice of triple talaq a criminal offence³¹ that was a retrograde step. The strategy of extending criminal law to this domain will reap the result of leaving the woman as vulnerable as before. Because once the husband is arrested and kept in custody, there's no way he can maintain his wife. Hence it is extremely important that the legislature maintains consistency and coherence with the judicial initiative in making these transformations fruitful and effective. It would thus be far better if we could substitute the theory of *separation of powers* with the theory of *association of powers*. The three organs of the government need not operate in water-tight compartments; it seems a better idea to suggest that they work with increasing co-operation and co-ordination with each other.

■

³⁰ *Shayara Bano vs Union of India and Others* (2017) 9 SCC 1

³¹ Muslim Women (Protection of Rights on Marriage) Act, 2019, (Act No 20 of 2019), s.4



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6. Legal Position of Online Retail in India

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Introduction

In E-commerce, numerous problems arise due to the buyer and seller being at a distance. E-commerce in recent times has been growing rapidly across the world. It is a type of business model that enables a firm or individual to conduct business over an electronic network, usually the Internet. In the recent past, it is observed that that more than 100 million consumers did online shopping, with mobile phones. The online shopping is certain to grow more in near future. Not only, shopping of clothes, accessories, electronic equipment's have increased, but also online ticket buyers and online food orders are increasing day by day with the upcoming services like Zomato and Uber eats. Apart from this, a huge amount of foreign investment is also increasing in this sector. In terms of promoters to shop online, the consumers are emphasized cash back guarantee.

However, there were some drawbacks highlighted by consumers, the important factor involved in online shopping is the fear of faulty products, issues involved in online payments, fear of posting their personal and financial details online etc.

The government is planning to bring in an e-commerce law and a sector regulator to effectively deal with all aspects of online retail. Apart from FDI Policy, which regulates foreign investment into the e-commerce industry, all other Indian laws, which would apply to any online business, would apply to e-commerce businesses as well. These includes –The Indian Contract Act 1872, and the laws relating to intellectual property such as the Copyright Act 1957 and the Trademark Act 1999. Apart from this the firm, which operates an e-commerce business, would also need to comply with applicable local laws such as the Shops and Establishments Act which are specific to different states, in relation to their physical offices. Most importantly it also includes the Information Technology Act 2000 ("IT Act") which contains specific provisions to regulate online transactions.

The Consumer Protection Bill 2018 has also introduced many provisions as stated above to keep up with the emerging market trends and further aims to simplify the consumer dispute adjudication process by including provisions for electronic filing and provisions for hearing or examination through video conferencing. Once passed, the Bill will certainly be a step forward towards protecting the rights and interests of consumers.

Conclusion

The best way to deal with such concerns is the incorporation of a Central e-commerce law dealing with multifarious issues involved in online industry. It is obvious that e-commerce related issues are not easy to manage due to technical expertise involved in such disputes. E-commerce disputes resolution is even more difficult and challenging especially when Indian Courts are already overburdened with court cases. Establishment of e-courts and use of online dispute resolution mechanism can be very practical.

E-commerce surge in India is prevalent since more than a decade. Despite this fact, India still doesn't have a proper codified set of laws for the online industry. In the absence of e-commerce specific laws, the question arises, where does the online industry stand right now in the eyes of the law. It's not practically possible to apply the existing segregated set of laws.

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15. Manual Scavenging: An Antithesis of Right to Human Dignity

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Nagpur.

Abstract

Manual scavenging is responsible for hundreds of deaths every year. It is a harsh reality that the dehumanising occupation still exists in India. Manual scavenging in India is a caste based occupation which involves cleaning of pit holes of insanitary or dry toilets resulting into deaths due to inhaling of poisonous gases and this serious issue needs attention. We are in the 21st century and still today such kind of occupations do exist which is a clear antithesis to dignified life which is guaranteed to every citizen in Indian Constitution. Another aspect of manual scavenging is it is a form of forced labour, which is prohibited by a legislative enactment namely "The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013". This paper aims to identify the shortcomings in the present Act, because in spite of this Act, the employment of manual scavenging is still in existence which can be analysed by the death tolls happened in last 5 years. There were instances of death while cleaning septic tanks, in various parts of country, recently. This calls for addressing the shortcomings in implementation of the manual scavenging law and also questions the applicability of Human rights enshrined in International declarations and Covenants.

Keywords: Manual scavenging, Human dignity, Forced labour, Rehabilitation.

Introduction

Manual scavenging refers to the practice of manually cleaning, carrying, disposing or handling in any manner, human excreta from dry latrines and sewers. It often involves using the most basic of tools such as buckets, brooms and baskets. The practice of manual scavenging is linked to India's caste system where so-called lower castes were expected to perform this job. Manual scavengers are amongst the poorest and most disadvantaged communities in India. According to latest statistics published by the International Dalit Solidarity Network,

practice. They suffer from the inhuman pain of scavenging human faeces and go through the agonizing pain and humiliation of discrimination, occupational health hazards, untouchability and social exclusion. Continuance of this inhuman practice of manual scavenging is a curse not only on those involved in this practice but on the country and putting an end to it is the responsibility of the country as a whole.

FootNote

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Teaching and Learning through Google Classroom - A Study

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Abstract

Today we are living in the age of science and technology, where we witness extraordinary technological advances. Technology has gained importance in all aspects of life including education. Since last decade, there has been a tremendous change in the perception of educators in respect of teaching and learning process. E-education is reality of the day, yet many teachers have been unable to identify which technological tool to be used in the classroom. From the available technological tools, Google Classroom is one of the best tool as it is free of cost, user-friendly and an innovative tool. Various studies have been carried out to know the utility and effects of Google Classroom. Findings of these studies suggests that, Google classroom is very effective, however, it is used by the educators mostly as a facilitation tool that can be used for basic classroom management and document management. The purpose of this study is to befriend the teachers of higher education with Google Classroom for the effective adoption and utilization of Google Classroom. To suggest the educators to acquaint themselves with all the features of Google Classroom so that they can use it for innovative and quality teaching. This will definitely empower the teachers technologically as well as intellectually. This will also help to strengthen the relationship with the students of 21st century, as they are more comfortable with technology.

Keywords: Google Classroom, Innovative teaching, Virtual Classroom, Teaching and learning process

1. Introduction

The greatest development in the last half of the century has undoubtedly been the change in the face of education. Today technology plays vital role in the field of education. Almost every country has accepted this change and has incorporated e-education in their education policies. Various studies have been conducted on the impact and effects of use of e- education and tools used for e-education in the classroom and the results of these studies say that e-education has been accepted by most of the teachers as well as by the students as a very innovative and useful method. The change in the perception of teaching and learning process has brought positive change. The teacher who adopts the technology with ease and applies it in day to day life, in campus as well as at home is generally referred to as an 'Innovative Teacher' and the teacher who doesn't use this technology in their teaching process is termed as an 'Instrumental Teacher' by the students.



If we look at the Indian scenario, since last decade there has been a change in the perception and attitude of teachers and students towards acceptance of technology in teaching and learning processes. Initially Indian teachers had shown non-acceptance of e-education methodology mostly due to their non-acquaintance and non-familiarity with the technology.

However, due to novel initiatives by the Government of India, there has been a drastic change in the perception towards e-education. Ministry of Home Resource Development, Government of India took initiative in the year 2017 to launch various digital initiatives for higher education with the help of leading institutes of technology in India and introduced 28 Digital Initiatives in Higher Education like SWAYAM (India's own MOOC), Swayam Prabha, National Digital Library, National Academic Depository and many more. Apart from the aforesaid initiatives MHRD has also started initiatives like "Cashless Campus" and "Digital Financial Literacy of Community of Students". University Grants Commission also drafted new Online Education Regulation and Rules to benefit the students in credit system. University Grants Commission, National Assessment and Accreditation Council and other Performance Indicating bodies encourages and insist upon the use of e-education. An important criteria to assess any higher education centre is the majority of classes using technology and the courses offered by the institutions through e-education. However, most of the teachers are not aware about the type of technologies available to be used in the classrooms, its importance and how to use these technologies with ease as a part of innovative teaching.

Author is not intending to question the authenticity of traditional teaching methodology. Author is a strong believer of learning every subject with human touch of a teacher. There is no substitute for a human teacher. The author is advocating the use of modern technology by the teacher as an additional method which will definitely add the interest and utility for the students. Therefore, the author is urging the educators to joint hands with the technology for the betterment of our own future.

From the available tools, the researcher has identified following four important classroom technology tools/Virtual Classrooms for e-learning which are called as Learning Management Systems/ LMS.

- a. Google Classroom
- b. Canvas
- c. Newsela (and Newsela Pro)
- d. Study.com

These are very important and useful tools which will definitely enhance both teaching and learning. However, Canvas, Study.com and Newsela Pro which is advanced version of Newsela are not free versions. The only free version of these tools is Google Classroom which was introduced by Google in the year 2014 and even after that its utility has been enhanced by introducing various new features. The researcher is a teacher of law and uses this Google classroom since last three years. The purpose of this study is to befriend the teachers of higher education with the Google Classroom for the effective adoption and utilization of Google Classroom.

2. Virtual Classrooms

Virtual classrooms are created through technology. This is a part of e-learning and many institutes and organisations including author's institute have adopted the concept of virtual classrooms to promote e-learning as it enables teachers and students to interact even beyond campus. There are various types of Virtual classrooms as mentioned above, however, the mostly acknowledged and accepted version is Google Classroom. This is because of its features, its utility and as it is available free of cost.



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Google Classroom is one of the best platform to manage and organise teaching process by teachers. Ideal features are- it is very simple to create, user friendly, free of cost and it gives the experience of innovative e-learning to the students. It is considered as one of the best ways to enhance the communication with the students beyond classroom, it also saves the time of teachers and keeps your work organised. For instance, assignment work can be created and posted to the students who will get it done within dead line provided by the teacher and then assessment can also be done through Google Classroom, which can be saved as further proof/ document. Every communication, shared documents, material or even assessed assignments will be saved for further references. The recent updated version even provides the facility of joining more than one teacher to manage the classroom. Through this unique feature a student is now able to interact with more experts with diverse approaches. And even both can plan the classroom discussion well in advance.

3. Why E-learning?

Every teacher is overburdened with workflow due to demand of today's world. A teacher has to engage four classes in a day means 24 classes per week. In one session a teacher is required to take at least two assignments, one quiz, one presentation, two written examination. Teacher has to set the question papers, evaluate answer sheets, make course plan. Teacher has to indulge into extensive research activity. There are number of administrative responsibilities on the teacher as he/she may be handling various committees like Anti Ragging Cell, Internal Complaints Committee, Student Grievance Cell, Women's development Cell and like. In many institutions teachers are involved in admission procedure, report writing, uploading the events on website. Teachers are also supposed to disseminate knowledge beyond the parent institute through guest lectures, interviews, participating, presenting and contributing research papers in interdisciplinary field through participation in seminars, workshops, symposia. Teacher has to organise many activities, conduct different competitions like quiz, case study, group discussion, presentations etc. Thus a modern teacher requires to balance multiple responsibilities with teaching. Therefore use of e-learning/ Virtual learning to easily balance all kinds of responsibilities is the best way out!

At the same time teaching to the 21st century students is a great challenge. Every information is available to the students on their fingertip. They are more comfortable with technology than learning in the classroom. So Google Classroom is the best solution to bridge this gap.

4. Google Classroom

Google classroom is very simple to create and use. You are supposed to link that with your Google Account. When you come to the page of Google Classroom, there is an option with 'plus sign', click on that button, two options will appear, Join class or create class. Teacher who intends to create a class can enter every information about the class like class, section, subject, classroom number. The classroom space will be created and one class code will appear on the page. Faculty can share that class code with the students through which they can join the class. In the same space, one can see four tabs Stream, Classwork, People and Grade. Through People's tab, teacher in charge can enter e-mails of the students and invite them to join the class. On this space the list of teacher in charge and students will appear. Through the Stream tab, teacher can communicate with students. Individually students can reply to the teacher's word. If student desires to have a word with the teacher privately, the latter can send personal messages which can be seen and answered by teacher with full privacy. In the classwork tab, there are different options through which different tasks can be assigned to the students like, create assignments and questions, quiz assignments. The teacher can use topics to organise classwork into modules or units, order work the way teacher wants his/her students to do it. Also faculty can share the material, documents, videos, power point presentations through this tab. Important web page to see relevant articles or relevant movies or videos also can be shared. To ensure that students have studied



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the shared information, quiz or exams can be planned. There is a system of group presentation, which can be utilised for joint projects by the students. And the grades tab, is available to grade the assignments or questions or any other work assigned to the students. Automatically the list of students whose assignments turned in will appear as a mark sheet and in the right hand space the assignment of same students will appear, the faculty can check it and immediately marks can be filled in the mark sheet. So grading system is very unique through which faculty can keep record of marks allotted to the students. Even teacher can have a track if few students have not submitted and may help the students in completion of assignment.

5. Benefits of Google Classroom

There are several benefits of Google Classroom to the teachers as well as to the students:

- This streamlines the communication and discussion through one forum/platform with all students as well as teacher/teachers.
- It's easy to manage, organise and assess assigned tasks not only for teachers but even for students.
- Teacher can instruct about the expected performance standard by him/her from the students and what is to be incorporated in the assigned work.
- Assignments can be checked with the help of anti-plagiarism tools to discourage students to copy from the Internet.
- Through grading system all assigned works can be evaluated and marks can be given, this can be stored without any paperwork.
- Teacher can share relevant reading material, documents, notes, PPT or even important link which students can access anytime anywhere.
- Teacher can share lesson plan, course outline and cases to refer beforehand.

6. Effectiveness of Google Classroom

Various studies have been conducted on the impact or effects of Google class room on teachers and students. Let's analyse the findings of few studies to understand the impact of Google Classroom.

Few responses from the teachers and Students (2016 to 2019)

- Initially teachers preferred using Facebook to LFS (Learning Feedback System) for announcing a quiz date or a topic for the upcoming class or assignment. But when they started using Google Classroom, it became popular amongst the students as they could also receive relevant material, resources and instructions directly from teachers [5].
- Few teachers started using Google Classroom as this is made mandatory by the Institutions or is required for their promotion. But when they got acquainted with the LMS, it became a habit to use it as they can organize many things with ease [3, 5].
- Few teachers commented that Google Classroom is very helpful to complete the syllabus within given time framework. Because of multiple responsibilities and national holidays it becomes really difficult to complete the syllabus. However, with Google Classroom teacher can conduct classes virtually from anywhere anytime. And use of technology for teaching process empowers the teachers technologically which builds up confidence [5].
- Three teachers agree that Google Classroom can promote collaborative learning. Students can make a group and submit their assignment or project work. They can send videos [5].
- Few students agree that Google Classroom is effective as an active learning tool [3, 6]. However they feel that they are not aware about all the features of Google classroom as many features have not been used by teachers.



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- Two students state if the teacher can arrange online quiz through Google Classroom, it would be really very interesting [5].
- Technology can serve as a useful tool in instruction but teachers need to know how to integrate technology into their teaching and how to meet their student needs, especially those with learning disabilities [6].

These are few observations of various studies conducted by different researchers. Author observed that all these studies have small sample size, yet findings have relevance. Author also conducted personal interviews of the teachers from parent institute who are using Google Classroom and found that more than 40% teachers are using Google Classroom. Most of the teachers started using Google Classroom because use of it is insisted upon by the institution and useful for their promotions. However, eventually teachers feel that, this is a very effective tool especially for announcements to the students regarding various events or class planning, organising and assigning various tasks, grading the students and storage of records. It means all features of Google Classroom has not been utilized by most of the teachers. There are certain limitations as well like lack of administrative support like free Wi-Fi campus and attitude of students and teachers towards acceptance of technology as useful instrument of learning. Excessive use of Google Classroom may discourage physical attendance in the classroom. This may also ignore the needs of the students with learning disabilities. Students who came from rural area may find use of technology difficult and thus may not get access to Google Classroom.

7. Conclusion

Teaching to the generation of 21st century is a challenging task. Students themselves can learn a lot through technology. For the student's expectations and satisfaction, teacher should adopt modern approach. This only will help, to assist student, to monitor student's activities and to impart quality education. This can be best achieved through virtual classroom in higher education. Technologies like Google Classroom will definitely increase educational activities where teachers will be more organised within little space and time. However, this shall be innovatively used to enhance access and quality of teaching. Educators should ensure to give more quality education than what they can in one hour classroom teaching. This will make the journey of learning more pleasant and that too in the presence of teacher. Through Google Classroom students can enjoy e-learning with freedom under the able guidance of teacher. So this is a unique blend of technology and human brain. This will not only enhance the learning process but it will certainly strengthen the relationship between teacher and student.

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Appendix A: Interview Questions for Teachers

- How long have you been teaching at Dr. Ambedkar College Deeksha Bhoomi, Nagpur?
- Have you adopted virtual classes? What type of Virtual classroom have you adopted?
- Why have you adopted Google Classroom?
- When have you started using Google Classroom?
- Do you use Google classroom regularly?
- What are the features of Google classroom you use most?
- What are the benefits of Google classroom according to your experience?



REVISITING THE PRINCIPLE OF ABSOLUTE LIABILITY VIS- A-VIS VIZAG GAS LEAKAGE

Dr. Mrs. Sandhya P. Kalamdhad*

ABSTRACT

The National Green Tribunal (NGT), New Delhi in a *suo-motu* case, on 8th May 2020, ordered 50 Crore compensation to be paid by the company to the victims of gas leakage in re: Styrene Gas leakage at LG Polymers Chemical Plant in R. R. Venkataram Village, Vishakhapatnam in Andhra Pradesh by applying the principle of Strict Liability. Application of strict liability brings with it many exceptions making the case weak if appealed and frustrates the intention of the Hon'ble Supreme Court in evolving the Doctrine of Absolute Liability in M.C. Mehta V. Union of India Case. Therefore author intends to revisit the principle of 'Absolute Liability' evolved by J. Bhagwati way back in the year 1987 in Bhopal Gas case to emphasis on how appropriate it would have been to apply this principle than the principle of 'Strict Liability'. This is the doctrinal research. This is the critical analysis of the Judgement delivered by Hon'ble National Green Tribunal.

KEYWORDS

Strict liability, Absolute Liability, Visag Gas Leakage, hazardous and inherently dangerous activity.

INTRODUCTION

On 7th May 2020, India witnessed reversal of fortune because of leakage of styrene gas at LG Polymers Chemical Plant owned by South Korean Company in Venkatapuram village, Vishakhapatnam in Andhra Pradesh. This ill-fated incidence was the cause of death of 11 innocent lives. It also injured 25 people critically and over a thousand people's health was compromised resulting in their hospitalization.

This incident reminded everyone about the Bhopal Gas Tragedy of 1984 for its parallelism. Though the Vizag Gas leakage was neither as fatal nor as devastating as the Metyl Isocyanate (MIC) Leakage in Bhopal, it is equally shattering and caused huge loss to the people in the vicinity, exiting flora and fauna and environment.

Imposition of liability in these kind of cases were

smoky before the Bhopal Gas Tragedy in India. We were dependent on the old rule framed by Justice Blackburn in the year 1866, in Rylands V. Fletcher i.e. the principle of 'Strict Liability'.

However, after two horrifyingly shaking Gas Leakage incidences of Shriram Food and Fertilizers and Union Carbide Corporation, in two consecutive years, i.e. 1984 and 1985, forced the Indian Judiciary to provide the country with a more stringent principle in terms of 'Absolute Liability'. The principle of 'Absolute Liability' was evolved by Justice Bhagwati in M.C. Mehta V. Union of India, i.e. Shriram Foods and Fertilizer Case. Unfortunately, it has not been followed thereafter in Bhopal Gas Tragedy Case as there was a compromise between Government of India and Union Carbide Corporation, USA. However, in

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numerous other cases (especially environmental cases) principle of 'Absolute Liability' had been followed by the Indian Judiciary.

The rule of 'Absolute Liability' was evolved to make the entrepreneur absolutely liable for any injury during inherently dangerous activity, without any exceptions. The present judgement of National Green Tribunal in Vizag Gas Leak Case seems to have forgotten this and applied the principle of 'Strict Liability', which Justice Bhagwati way back in the year 1987, very boldly dared to refuse to follow in these kind of incidences.

There is no doubt that LG Polymers were carrying out hazardous activities, as styrene is a hazardous gas (Styrene gas is a hazardous chemical as defined under Rule 2(e) read with Entry 583 of Schedule I to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989). Though it may not be as dangerous as Bhopal Gas tragedy it deserves the application of absolute liability. Author appreciate the efforts on the part of National Green Tribunal, however, feels that the Tribunal should have applied the principle of 'Absolute Liability'. Therefore, author wishes to revisit the principle of 'Absolute Liability' to justify and emphasize the need of application of Absolute Liability in ill-fated incidence like Vizag Gas Leakage.

HEALTH HAZARDS DUE TO EXPOSURE TO STYRENE GAS

After this leakage many organisations, Environmental Group and experts gave their opinions on the basis of short term studies. For example, Dr. K. Vijay Kumar (2020), Head of the Department of Respiratory Medicine, Andhra Medical College said, “Breathlessness, respiratory problems, irritation in eyes, indigestion, nausea, transient loss of consciousness, unsteady gait,

giddiness are the causes by exposure to it. In this incident, people were exposed to the gas for a short duration, so there may not be any long-term effects”. He further stated, “People suffering from respiratory illness such as asthma, and those who have chronic obstructive pulmonary diseases, these conditions may get exaggerated. Those suffering from diabetes or hypertension may have anxiety disorders.”

Experts say that if people are exposed to the gas for a long period, there is a chance of their developing leukaemia and headaches. Studies on the effects on health due to occupational exposure to styrene have, however, been inconclusive.

Satinath Sarangi (2020), an activist who has been working for the Bhopal gas tragedy victims since years said, “It is the long-term impact of styrene that I am more worried about. It's classified as a possible human carcinogen by the international agency for cancer research. Also, it is known to cross the placental barriers, damage the foetus, genetic damage just like how in Bhopal methyl isocyanate caused chromosome aberrations.” He further stated that, “Styrene is an extremely irritant gas. It irritates the skin, nose, eyes, and most importantly it irritates the lungs, just like the gas that was leaked in Bhopal. There is so much irritation in the lungs that they are filled with body fluids which causes obstructive damage and death”.

There are many other organizations like NEERI who will be conducting long term studies on the exposure of styrene gas. However, the present state of scenario clearly indicates that styrene gas has terrible health hazards.

Styrene gas is a hazardous chemical as defined under Rule 2(e) read with Entry 583 of Schedule I to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989. The Rules require on-site and

off-site Emergency Plans to comply with the said rules and other Statutory Provisions. Therefore, the author most humbly submits that, this is sufficient to impose principle of 'Absolute Liability' than 'Strict Liability'.

JUDGEMENT OF NATIONAL GREEN TRIBUNAL

The National Green Tribunal (NGT), New Delhi in a *suo-motu* case gave a judgement in re: Syrene Gas leakage at LG Polymers Chemical Plant in R. R. Venkataram Village Vishakhapatnam in Andhra Pradesh and by applying the principle of Strict Liability ordered 50 Crore compensation to be paid by the company to the victims of gas leakage. The author appreciate the efforts on the part of Tribunal and would like to refer to para 2 of the judgement, which says that, "... Leakage of hazardous gas at such a scale adversely affecting public health and environment, clearly attracts the principle of 'Strict liability' against the enterprise engaged in hazardous or inherently dangerous industry. Such an entity is liable to restore the damage caused under the Environment Law, apart from other statutory authorities responsible for authorising and regulating such activity may also be accountable for their lapses, if any in dealing with the matter. It is also necessary to ensure that all necessary steps are taken to prevent recurrence of such an incident..."

From this para it is evident that the Tribunal has applied the principle of 'Strict liability'. Actually it should have been the principle of 'Absolute Liability'. To understand this better let's understand the concept of Strict and Absolute Liability.

PRINCIPLE OF STRICT LIABILITY

The Principle of Strict Liability was evolved by J. Blackburn in Rylands V. Fletcher. In his words the rule says that, "The rule of law is that the person who,

for his own purpose, brings on his land and collects and keeps their anything likely to do mischief if it escapes, must keep it in at his peril; and if he does not do so prima facie answerable for all the damage which is the natural consequence of its escape."

So there are three important ingredients to impose Strict Liability one, non-natural use of the land, second, escape of something from its premises and third, resultant injury. And the most important is there are five exception to this rule. The judgement of J. Blackburn, approved by the House of Lords itself recognised that liability is not absolute being subject to certain exceptions. Means if anyone's case falls within any of these exceptions, he can claim exemption from liability.

1. Act of God (Vis Major): which is defined to be such a direct violent, sudden, and irresistible act of nature as could not by any amount of human ability, have been foreseen or if foreseen, could not by any amount of human care and skill have been resisted. For example: storm, tempest etc.
2. Wrongful act of a third party: A landlord using his premises in an ordinary and proper manner is born to exercise all reasonable care, but he is not responsible for damage not due to his own default, whether that damage be caused by inevitable accident or wrongful act of third persons.
3. Plaintiff's own default: If plaintiff himself is at fault he cannot claim compensation and therefore there will be no strict liability. As he is the author of the act, he cannot be benefitted.
4. Artificial work maintained for the common benefit of plaintiff and defendant, or with the consent of the plaintiff: For example

common water tank build for the benefit of all the flat owners.

5. When it is the consequence of an act done for public purpose in the discharge of a public duty under the express authority of a Statute: “No action will lie for doing that which the legislature has authorised, if it be done without negligence, although it does occasion damage to anyone”.

PRINCIPLE OF ABSOLUTE LIABILITY

J. Bhagwati in *M.C. Mehta V. Union of India* evolved a more stringent rule than Strict Liability called as Absolute Liability. The case related to the harm caused by escape of Oilium Gas from one of the units of Shriram Foods and Fertilizers Industries. The Court Held that the rule of *Rylands V. Fletcher* which was evolved in the nineteenth century did not fully meet the needs of a modern industrial society with highly developed scientific knowledge and technology where hazardous or inherently dangerous industries were necessary to be carried on as part of the development programme and that it was necessary to lay down a new rule not yet recognise by English law, to adequately deal with the problems arising in a highly industrialized economy. The Court laid down the rule as follows: “where an enterprise is engaged in a hazardous or inherently dangerous activity and harm results to anyone on account of an accident in the operation of such hazardous or inherently dangerous activity resulting for example, in escape of toxic gas, the enterprise is strictly and absolutely liable to compensate all those who are affected by the accident and such liability is not subject to any of the exceptions which operate vis-à-vis the tortious principle of Strict Liability under the rule in *Rylands V. Fletcher*. The Court earlier pointed out that this duty is “absolute and

non-delegable” and the enterprise cannot escape liability by showing that it had taken all reasonable care and there no negligence on its part”.

To understand the authors argument that why Absolute liability need to be applied in cases like Vizag gas leakage, it is very essential to understand the distinction between Strict and Absolute liability.

THE DISTINCTION BETWEEN STRICT AND ABSOLUTE LIABILITY

The rule in *Rylands V. Fletcher* requires non-natural use of the land by the defendants and escape from his land of the thing which causes damage. The rule in *M.C. Mehta V. Union of India* is not dependent on this conditions. The necessary requirements for applicability of the new rule are that the defendant is engaged in a hazardous or inherently dangerous activity and that harm results to anyone on account of an accident. In the operation of such hazardous or inherently dangerous activity. The rule in *Rylands V. Fletcher* will not cover cases of harm to persons within the premises for the rule requires escape of the thing which causes harm from the premises. The new rule makes no such distinction between persons within the premises where the enterprise is carried on and persons outside the premises for escape of the thing causing harm from the premises is not a necessary condition for the applicability of the rule. Further, the rule *Rylands V. Fletcher* though strict in the sense that it is not dependent on any negligence on the part of the defendant and in this respect similar to the new rule, is not absolute as it is subject to many exceptions, but the new rule in *Mehta* case is not only strict but absolute and is subject to no exceptions. Another important point of distinction between the two rules is in the matter of award of damages. Damages awardable where the rule in *Rylands V. Fletcher* applies will be ordinary or compensatory ;

but in case where the rule applicable is that laid down in M C Mehta's case the Court can allow Exemplary Damages (The main aim of exemplary damages is to punish the wrongdoer, to deter him from similar conduct in future. Thus it may be an exorbitant amount) and the larger and more prosperous the enterprise, the greater must be the amount of compensation payable by it.

To give statutory effect to the efforts of J. Bhagwati, legislature enacted Public Liability Insurance Act, 1991. This is an important legislation to promptly compensate members of the public from accidents arising out of hazardous industries. As the long title discloses, this is an Act to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling any hazardous substance. Sec. 3 of the Act provides for liability on no fault basis to the extent mentioned in the schedule in case of death or injury resulting from an accident while handling any hazardous substance. The liability to pay relief under the Act does not take away the right of the victim or his dependent to claim higher compensation under any other law but the amount of such compensation shall be reduced by the amount of relief paid under the Act. The liability created by the Act thus does not in any way affect the liability under the Tort law except to the extent of the amount of relief paid under the Act.

From the above discussion it is very clear that J. Bhagwati evolved the principle of absolute liability to cover all the cases of hazardous and inherently dangerous activities with no exception. Therefore it is argued once again that, absolute liability should have been invoked and applied to Vizag Gas Leakage.

CONCLUSION

Vizag gas leakage undoubtedly is alarming and conscious actions are required to avoid recurrence of such incidences in future. To ensure this there shall be application of 'Absolute Liability' as then only there will be 'strict and absolute liability' on the entrepreneur without any exception and imposition of exemplary damages will play the role of deterrence in the mind of entrepreneurs who are carrying inherently dangerous activities. This will certainly be beneficial for life and environment. Therefore there should have been application of 'Absolute Liability' instead of 'Strict Liability' by the National Green Tribunal in Vizag Gas leakage case.

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IMPLICATIONS OF CROSS BORDER SURROGACY ON PARENTHOOD: A STUDY

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ABSTRACT

The desire to have a progeny is one of those basic characteristics that define humans. And today, with the technological advancement in the field of medicine, it is possible to artificially conceive a human, for those who may not be in a position to conceive naturally due to any reason. There are numerous Artificial Reproductive Technologies out there, waiting to bless one with a child. One of the most sought after and known (and scandalous) techniques is Surrogacy. Due to social obligations, financial disabilities, legal restrictions and lack of access to technology in one's country, cross border (international) surrogacy is something very common these days. But due to numerous legal, ethical, social, cultural, political, religious, and personal diversities at an international level, various hurdles need to be overcome for availing the luxury of cross border surrogacy. Perhaps, cross border surrogacy is a package full of uncommon challenges, including but not limited to: the infant's nationality and the intimacy of the relationship between the parent and the child.

This study will highlight and analyse the legal dimensions of this 21st Century socio legal problem. While simultaneously, taking into consideration the decisions given by different courts on an international scale on many occasions. The Tonic of International Heterogeneity of Law isn't brew-able in this case, due to differing political, social, legal, and cultural views at the domestic level. Nonetheless, this study will try to estimate the possibility of hatching a common solution to, if not to end, but to a certain extent, reduce the magnitude of the severity of this international impasse.

Keywords: Reproductive Technology, Cross Border Surrogacy, Parenthood, Nationality, Cross Border Reproductive Solutions.

I. INTRODUCTION

"Making the decision to have a child-it's momentous. It is to decide forever to have your heart go walking around outside your body."

-Elizabeth Stone

To have a child is an instinct of a human being. It is recognized by the law and man has been granted the right to procreate. Indeed children are the most precious and beautiful gift of God to parents. But sometimes some people are deprived of this valuable gift.

However, contemporary medical technology has in recent times made extraordinary advances in responding to the desire of women or men to have children. Today we are living in the age of science and technology where we witness extraordinary scientific advances. Medicine, particularly in the area of reproduction has brought about a revolution. This revolution first began in the 1960s with the development of contraceptives that separated reproduction from

sexual intercourse pregnancy¹. More technologies that Inescapably, gen jumped ahead of alone. They conc plethora of vexin Any "procedure (the traditional m term "Assisted ranging from reli and embryo tran baby technology cloning. Since t pace. They have motherhood⁴. A is the increasing Today the dema people rely on denial of surro infrastructure, sometimes the The cross bor plethora of vex all over the v citizenship st surrogacy is l implications⁶. Therefore, th

¹ R. Black and
² Andre P. R
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³ Supra Note 1
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⁵ SAMA: Re
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sexual intercourse without having to be overly concerned with the possibility of causing pregnancy¹. More recently, this revolution has involved the development of reproductive technologies that allow reproduction without the usual traditional intercourse between partners². Inescapably, genetics and technology that have grown to respond to scientific advances have jumped ahead of ordinary human comprehension. Ergo, these issues cannot be left to scientists alone. They concern lawyers worldwide. The success of these technologies has today caused a plethora of vexing and controversial legal enquiries to which answers are not readily available.

Any "procedure or method designed to enhance fertility or to compensate for infertility" outside the traditional means of procreation can be labelled as assisted reproductive technology³. The term "Assisted Reproductive Technologies" (A.R.T.s) encompasses various procedures, ranging from relatively simple intrauterine insemination (IUI) to variants of in-vitro fertilization and embryo transfer (IVF-ET), also referred to as IVF and more commonly known as "test tube baby technology" and cryopreservation egg and sperm donation, surrogacy and more recently cloning. Since the latter half of the 20th century, these technologies have developed at a rapid pace. They have also influenced the way in which society views pregnancy, reproduction and motherhood⁴. An important factor behind the increased interest in A.R.T., especially surrogacy, is the increasing urge of human beings to have their own genetically linked children.

Today the demand to have children through surrogacy has crossed the national borders. Many people rely on cross border surrogacy due to many reasons like legal restrictions or complete denial of surrogacy for a same sex couples or single parents or demand for low cost, good infrastructure, availability of surrogate mothers, skilled doctors, easy documentation; sometimes the parents also want to keep secrecy about the artificial birth of their child and so on. The cross border demand of surrogate mothers or for gestational surrogacy brought about a plethora of vexing and controversial questions and led to many socio legal complexities, almost all over the world. This is particularly evident in cases involving legal tussles about the citizenship status of children born through transnational surrogacy arrangements⁵. Although surrogacy is by no means a new practice, courts and legislators still struggle with its legal implications⁶.

Therefore, this study will highlight and analyse the legal dimensions of this 21st Century socio

¹ R. Black and J. C. Merrick, *Human Reproduction Emerging Technologies* 85 (1995).

² Andre P. Rose, "Reproductive Misconception: Why Cloning is not just another Assisted Reproductive Technology" 48 *Duke LJ*, 1133-1156 at 1135 (1999).

³ *Supra* Note 1.

⁴ Sama Team, "Assisted Reproductive Technologies in India: Implications for Women", *Economic and Political Weekly*, June 9 (2007).

⁵ SAMA: Resource Group for Women & Health, "The Regulation of Surrogacy in India: Questions and Complexities", *The Medico Friend Circle Bulletin* available on samawomenshealth.wordpress.com (23rd April 2011).

⁶ Courts and legal writers also have long been aware of AI use by the medical profession and of the significant legal problems associated with it. A problem involving the legal aspects of AI reached the S.C. of Ontario as long ago as 1921. *Orford V. Orford*, 58 D.L.R. 251, Ont. 1921.

legal problem in respect to cross border surrogacy. The study will also review the decisions given by different courts on issues of cross border surrogacy. A more profound jurisprudential concern is whether the International legal system can deal adequately with the human problems created by present and future reproductive science and technology. The tonic of International Heterogeneity of Law isn't brew-able in this case, due to differing political, social, legal, and cultural views amongst countries. Nonetheless, this study will try to estimate the possibility of hatching a common solution to, if not to end, but to a certain extent, reduce the magnitude of the severity of this international impasse.

II. LEGAL IMPLICATIONS

It is estimated that 15% of couples around the world are infertile. Undoubtedly, these techniques provide a breakthrough in the treatment of infertile couples, same sex couples and single parents. Though the desire to have children may be universal, there is no consensus on policies adopted to regularise these practices due to varied cultures and practices all across the globe. This scientific development has got a mixed reaction throughout the globe. Therefore, the legal protection concerning access to technology as well as legal protection to the participants and children born through A.R.T. varies from country to country. Certain technologies under A.R.T. are not available in few countries like: surrogacy is completely banned in Sweden, France and Germany. Due to religious and cultural diversities some countries may deny particular category of people from availing technologies, for example, according to the recent regulation in India⁷, homosexual couple and single parents were denied access to A.R.T. Apart from this, there are various challenges and issues involved due to great disparities in legal approach in different countries. There are instances where an illegal surrogacy programme has been arranged by Attorneys, duping the intended parents as well as the surrogate mother. In many cases, the children have been abandoned by the commissioning parents because of divorce between the intended parents or due to some deformities in the child. Sometimes enormous expenses may be incurred due to complexities during or before the birth of the child and as there is no pre-birth order of parentage, intended parents are unable to claim medical insurance as they are on foreign soil, leading to enormous economic pressure. Surrogate mothers may not be aware of the higher risk involved in the cross border surrogacy due to illiteracy and poverty. There might be issues regarding citizenship and recognition of parental status in their home country, where surrogacy may be illegal. However, the times are rapidly moving, affecting the way the people live, how they communicate with each other, how they spend time and even how they procreate. Accordingly, advanced technologies demand legal intervention. Therefore this paper will explore the legal dimensions and implications of International disparities on one demanding

⁷ Visa Rules for Surrogate Parents, 2013

treatment at Internation

III. CROSS BORDE

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India opened up to con Georgia, Russia, Thail carry another's geneti transfer. The low-cost surrogates have made The Great Britain, Th any official figures or 2012 estimated the su clinics across India⁸. I surrogacy arrange me many complications 2009, The Law Com Regulate A.R.T. Clin Assisted Reproducti Council of Medical which a substantial question remains, th

United States of A

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⁸ Nita Bhalla an Sep 30, 2013.

⁹ Two leading cas

treatment at International scenario i.e. Cross border Surrogacy.

III. CROSS BORDER SURROGACY: GLOBAL POLICIES AND PRACTICES

India:

India opened up to commercial surrogacy in 2002. It is among just a couple of nations including Georgia, Russia, Thailand and Ukraine and a couple of U.S. states where women can be paid to carry another's genetic child through a process of in-vitro fertilization (IVF) and embryo transfer. The low-cost technology, skilled doctors, scant bureaucracy and a plentiful supply of surrogates have made India a preferred destination for fertility tourism, attracting nationals from The Great Britain, The United States, The Australia and The Japan, to name a few. There are not any official figures on how large the fertility industry in India is. A U. N. backed study in July 2012 estimated the surrogacy business at more than \$400 million a year, with over 3,000 fertility clinics across India⁸. People travel to India to commission a baby and doctors become brokers in surrogacy arrangements. Due to the relative lack of legal regulation on the issues of surrogacy, many complications arose in the past in respect to cross border surrogacy⁹. Later, in August 2009, The Law Commission of India prepared a detailed report on, "Need for Legalization to Regulate A.R.T. Clinics as well as Rights and Obligations of Parents to a Surrogacy". A Draft on Assisted Reproductive Technology (Regulation) Bill and Rules-2016, prepared by the Indian Council of Medical Research (ICMR), was introduced in the Lok Sabha in September 2020, in which a substantial section is devoted towards regulating surrogacy arrangements. The real question remains, though: When will this bill be enacted?

United States of America:

In the United States of America, there is no federal legislation in respect to A.R.T. However, most of the states now have either legislation or guidelines on the subject. In the United States of America also, like England, many States prohibit Commercial Surrogacy. The Uniform Parentage Act, 1987 of the USA Federal statute neither expressly precludes nor approves the use of AID by unmarried women. However, in some states in the USA, e.g. Connecticut, Kansas and Oklahoma the use of AID is arguably limited to husbands and wives. However, Barbara Kritchevsky, in 'the unmarried women's Right to AID: A call for Expanded definition of Family' argues that statutes that do not mention 'unmarried women' do not prohibit them from AID. Article 7 of The Uniform Parentage Act, 2000, discusses the parental status of the donor. It states that the donor is not a parent of the child conceived using assisted reproduction. Further, section 703 of article 7 of The Uniform Parentage Act, 2000, states that, 'if the husband provides sperm for, or consents to, assisted reproduction as provided in section 704¹⁰ he is the father of the

⁸ Nita Bhalla and Mansi Thapliyal, "India seeks to regulate its booming 'rent-a-womb' industry" Mon Sep 30, 2013.

⁹ Two leading cases on this will be discussed in the later part of the paper.

resulting child¹⁰ :

Canada:

According to the Canadian Law Reform Commission's working paper on access to A.R.T. Legislation governing access to medically assisted procreation technologies should respect the right to equality. Access should be limited only in terms of the cost and the scarcity of resources. Where limitation is necessary, selection should not be based on unlawful grounds for discrimination within the meaning of provincial legislation (family status, marital status, sexual orientation and so on). Eligibility to participate in A.R.T. treatment according to the Ontario Law Reform Commission should 'be limited to stable single men and to stable single women in stable marital or nonmarital unions.' Today Canada has federal legislation in respect to A.R.T.

United Kingdom:

The British Columbia Royal Commission (Ninth Report on Family and Children Law: Artificial Insemination (1985)) proposed that the guiding standard should be an applicant's ability to 'nurture'. The Human Fertilization and Embryology Act (HEFA), 1990 does not include single or unmarried women but enjoins the physician during treatment to consider the wellbeing of the child including the presence of a father. In England, Surrogacy arrangements are legal and the Surrogacy Arrangement Act, 1985 prohibits advertising and other commercial aspects of Surrogacy. Parental Orders in UK can currently only be granted to couples, one of whom must be the genetic parent of the child, and one of whom must be domiciled in the UK, and the consent of the surrogate and her spouse (where applicable) is required¹².

Comparative Analysis of Legislative regime overseas:

The above discussion clearly states that the varying policies have been adopted by different

Country	Specific Legislation or Guidelines
America	No specific legislation. A.R.T. is regulated by a combination of state and federal government regulation. Approximately 16 states have laws that even mention human cell transfers. Most states have been content to let the industry regulated itself.

¹⁰ S.704 of Uniform Parentage Act, 2000: (a) Consent by a married woman to assisted reproduction must be in a record signed by the woman and her husband. This requirement does not apply to the donation of eggs by a married woman for assisted reproduction by another woman. (b) Failure of the husband to sign a consent required by subsection (a), before or after birth of the child, does not preclude a finding that the husband is the father of a child born to his wife if the wife and husband openly treated the child as their own.

¹¹ Assisted Human Reproduction Act, 2004, available at <https://laws-lois.justice.gc.ca/eng/acts/a-13.4/page-1.html>.

¹² Vasanti Jadv, Helen Prosser & Natalie Gamble (2021) Cross-border and domestic surrogacy in the UK context: an exploration of practical and legal decision-making, *Human Fertility*, 24:2, 93-104, <https://doi.org/10.1080/14647273.2018.1540801>.

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Country	Specific Legislation or Guidelines
Canada	Assisted Human Reproduction Act, 2004, which was earlier applicable to all the states. However the State of Ontario filed a suit before the S.C. of Canada, which left many things upto the province. But till date no state law on A.R.T.
Australia	Australia regulates A.R.T. at both the federal and state level, with the state providing the foremost regulation. The key federal law is the Prohibition of Human Cloning for Reproduction and the Regulation of Human Embryo Research Amendment Act 2006. The National Health and Medical Research Council publish Ethical Guidelines on the utilization of Assisted Reproductive Technology in Clinical Practice and Research. These general guidelines must be followed for A.R.T. centers to be accredited by the Reproductive Technology Accreditation Committee.
United Kingdom	The United Kingdom's laws on A.R.T. include the Surrogacy Arrangement Act, 1985, the Human Embryology & Fertilization Act, 1990, The Human Fertilization & Embryology Act, 2008 and the Human Reproductive Cloning Act, 2001.
India	<ul style="list-style-type: none"> • National Guidelines for Accreditation, Supervision and Regulation of ART Clinics in India, 2005. • Ethical Guidelines for Biomedical Research On Human Participants, 2006. • 228th Law Commission Report on Surrogacy, 2009. • Assisted Reproductive Technology Bill, 2010 • Visa Rules for Surrogate Parents, 2013 • Assisted Reproductive Technology Bill, 2013, 2016, 2019

countries to regulate the practices of surrogacy due to social, cultural and political diversities. This leads to many legal, ethical and social complex problems in trans-border surrogacy. This can be further elaborated by reviewing the different case laws on cross border surrogacy.

IV. CROSS BORDER SURROGACY: JUDICIAL APPROACH

Cross-border surrogacy has led to litigation in both domestic courts and within the European Court of Human Rights. The case law from both of these are shaping the developing understanding of the scope of national legislation regarding surrogacy. Cross-border reproductive tourism has put the scope of national law to the test. Judging these cases, the courts need to take under consideration not only domestic legislation, but also international

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s of the ruling will legally be Messias's children
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a *visu* Mr Messias's passport so in order to return to France in
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European Court of Human Rights that their right for private and family life
right when the State would not recognize the filial relationship legal establishment
reference court, and that due refusal to legally recognize the relationship was not in the

best interest of the children
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¹⁷ *Mariposa*, "Wife of surrogacy agreement", available at <http://www.abc.com.au/news/2014-10-14/messiasos-v-france-2014>.
¹⁸ *Labassee v France*, 2014.
¹⁹ *Labassee v France*, 2014.
²⁰ *Labassee v France*, 2014, para 1.
²¹ *Labassee v France*, 2014.

²² *Messiasos v France*.
²³ *Labassee v France*.
²⁴ *Labassee v France*.
²⁵ *D and Other v Belg*.
²⁶ *Labassee v France*.

conventions the states have contracted and the principles, such as the priority of the best interest of the child, stemming from them.¹³

There are two landmark cases in the European Court of Human Rights' case law regarding reproductive tourism. The status of reproductive tourism was first established as a valid and legitimate alternative to home country services in the case of *A, B and C v. Ireland* in 2010, which was reinforced in the following year in *S.H. and Others v. Austria*.¹⁴ According to the Austrian government, the Austrian legislation does not need to adapt to the medical advancements, because the services that are illegal in Austria can, in fact, be obtained from abroad and furthermore subsequently fully legitimized by Austrian law when returned to the country. In these cases, the European Court of Human Rights has unequivocally established medical and specifically reproductive tourism as a basis to maintain a broad margin of appreciation when it comes to restrictive legislation in a member state.

*Mennesson v. France*¹⁵ was one of the two very similar surrogacy cases brought before the European Court of Human Rights almost simultaneously. The Court decided to handle the *Mennesson* case and the *Labassee*¹⁶ case proceedings simultaneously.¹⁷ Following the European Court of the Human Rights judgements in these cases, the Court of Cassation released a press release stating that henceforth 'surrogate motherhood alone cannot justify the refusal to transcribe into French birth registers the foreign birth certificate of a child who has one French parent'.¹⁸

The *Mennesson*, a married French couple, had gone to California and entered into a gestational surrogacy agreement. Surrogacy was not commercial and the compensation was paid for expenses incurred by her. The Supreme Court of California ruled that any children of the surrogate born within four months of the ruling will legally be *Mennesson's* children. Subsequently, the *Mennesson* twins were born in October 2000, and had birth certificates stating the *Mennesson* as their parents in compliance with the Californian court's ruling.

The applicants tried to enter the children's name into the French register of births, marriages and deaths to add the children unto *Me Mennesson's* passport so in order to return to France in November 2000. The consulate rejected the application suspecting that a surrogacy arrangement had taken place. Despite this, the children were able to travel to France because they had been issued with US passports where the *Mennessons* were named as their parents. The *Mennessons* complained to the European Court of Human Rights that their right for private and family life had been infringed when the State would not recognise the filial relationship legally established abroad by a relevant court, and that the refusal to legally recognise the relationship was not in the

¹³ Mary Keyes, "Cross border surrogacy agreements", available at <https://core.ac.uk/download/pdf/43338789.pdf>

¹⁴ *S.H. and Others v. Austria* [GC], 2010, para 114.

¹⁵ *Mennesson v. France* 2014.

¹⁶ *Labassee v. France*, 2014.

¹⁷ *Mennesson v. France*, 2014, para 3.

¹⁸ Cour de Cassation, 2015.

best interest of the interests of the child trying to discourage considered that the children's identity was not in the best biological father inheriting the app *Labassee v. Fran* *citoyenne Labass* US using Mr La agreement. Mor Authorities refus suspicion of the privacy had been the French Auth marriages and d case as it had ir family life unde covered right to *D and Other v.* agreement in U was issued foll the fact of usin the Belgium e relationship be directing the E that the patern and therefore relevant Belg the parental r from Ukraine According to sufficient ba

¹⁹ *Mennesson*

²⁰ *Labassee v.*

²¹ *Labassee v.*

²² *D. and Othe*

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best interest of the children. The Court remarks that it has to take into consideration the best interests of the children. Acknowledging that with the annulment of recognition France was trying to discourage its citizens from attempting to bypass national legislation, the Court considered that the non-recognition and the uncertainty of ever gaining nationality affected the children's identities negatively, both internally and within the French society.¹⁹ It stated that it was not in the best interests of the children not to have a totally recognised relationship with their biological father and Mrs Mennesson, since it affected the children's position in regards to inheriting the applicants.

Labassee V. France, a contingently syncing case arose in the state of France. Like Mennesons, *citoyenne* Labassee was infertile, which led the concerned to go for gestational surrogacy in the US using Mr Labassee's sperm and donor's ova. A child was born through this surrogacy agreement. More or less, similar events as in Mennesons' case happened and the French Authorities refused to register the child's birth certificate into the French Register of Births due to suspicion of the child being a surrogate child. The Court held that the child's right to respect for privacy had been infringed upon. And taking into consideration the interest of the child, asked the French Authorities to register the child's birth certificate into the French register of births, marriages and deaths.²⁰ The European Court of Human Rights gave an identical ruling in this case as it had in the Mennesson case, holding that there had been no violation of the right to family life under the Article 8 in regards to Mr. and Ms. Labassee but that the child's Article 8 covered right to respect for privacy had been infringed upon.²¹

D and Other v. Belgium,²² in this case, a married Belgium couple entered into a surrogacy agreement in Ukraine. The child was born through surrogacy and the Ukraine birth certificate was issued following the Ukrainian law mentioning the applicants as the parents without stating the fact of using a surrogate. The applicant sought to issue a Belgium passport to the child from the Belgium embassy which was rejected on the basis of insufficient documents proving the relationship between the parents and the child. The parents then sought an order from the Court directing the Belgium authorities to issue the child a travel document. However, the Judge found that the paternity was not established with the DNA test. The applicant's resident permit expired and therefore they had to travel back to Belgium without their son. After three months, the relevant Belgium court was provided with sufficient evidence and the Belgian court recognised the parental relationship and the applicant received the travel documents required to fly the child from Ukraine to Belgium.

According to Belgian law²³ The Ukrainian birth certificate was not to be recognised as a sufficient basis for establishing a kinship. Hence, issuing the child with a passport, save for

¹⁹ Mennesson v. France, 2014, paras 96-97.

²⁰ Labassee v. France, 2014, para 14.

²¹ Labassee v. France, 2014, p. 81.

²² D. and Others v. Belgium, 2014.

²³ Belgian Code of Private International Law, art. 27, para 1 and idem art. 62, para 1.

situations where "there is a doubt as to the applicant's identity or nationality, the issue of the passport or other document in lieu thereof may be suspended until the person or the department has established his or her identity or Belgian nationality by means of documents or conclusive testimonies".²⁴ The Court concluded that the Belgian State had acted within the afforded margin of error and the measures it had taken were in proportion with the objective of protecting the rights of others. The Court declared the application inadmissible.

Another important case on Cross border surrogacy i.e. *Baby Manji Yamada V. Union of India and Another*²⁵ is an Indian case relating to production /custody of a child Manji Yamada. Emiko Yamada, claiming to be a grandmother of the child, has filed this petition. In this case Baby Manji Yamada was given birth by a surrogate mother. The biological parents Dr. Yuki Yamada and Dr. Ikufumi Yamada came to India in 2007 and had entered into a surrogacy agreement between the biological parents on one side and the surrogate mother from Anand, Gujrat, on the other side. After birth, Baby Manji was left in limbo due to divorce of the contracted Japanese couple. The desperate situation of the few days' old Japanese baby, stuck between a surrogate mother, who was only acting under a commercial arrangement and was not keen to keep the baby, and the contracting mother who was no longer interested in the baby, and the contracting father, who wanted the baby but certain provisions of the Indian law didn't allow him to do so. When father had to go back to Japan as his visa expired, she was under the care and supervision of her paternal grandmother in the clinic in Anand. She was issued a birth certificate in the name of her genetic father by the Municipality of Anand. According to the existing laws, the birth certificate would entitle Mrs. Yamada to adopt the baby. Later, though passport had been rejected, a certificate of identification was issued to Baby Manji by the Regional Passport Authority, Rajasthan just to facilitate her transit out of the Indian Territory.²⁶ The Court in this case observed that, surrogacy is a well-known method of reproduction whereby a woman agrees to become pregnant to gestate and give birth to a child whom she will not raise but handover to a contracted party. In some cases surrogacy is the only available option for parents who wish to have children who are biologically associated with them. The court further explained the different forms of surrogacy practices available in India and held that commercial surrogacy is legal in India. The Court went ahead and said, "Intended parents may arrange a surrogate pregnancy because a woman who intends to parent is infertile in such a way that she cannot carry a pregnancy to term. Examples include a woman who has had hysterectomy, has a uterine malformation, has had recurrent pregnancy loss or has a health condition that makes it dangerous for her to be pregnant. A female intending parent may also be fertile and healthy, but unwilling to undergo pregnancy. Alternatively, the intended parent may be a single male or male homosexual couple."²⁷

Thus, in *Baby Manji*, the Supreme Court did not rule surrogacy contracts as valid under Indian

²⁴ Belgian law of 14 August 1974 on the issue of passports, sec. 7.

²⁵ AIR 2009 Supreme Court 84.

²⁶ This fact was highlighted in the case of *Jan Balaz v. Anand Municipality and Others*, a decision of the High Court of Gujarat which involved the question of nationality of twins born to an Indian surrogate mother with the help of an unknown Indian donor and the sperm of the father, *Jan Balaz*. AIR 2010 Guj. 21.

²⁷ *Baby Manji Yamada Vs Union Of India*(2008) 13 SCC 518

law, but it did not n methods of surrog commercial. While contracts, the Supr various reasons.

Jan Balaz v. Anand may arise out of legislation to regul babies were conce the intended mothe were German natio The issue in this c Government refus the surrogacy was denied Passport t therefore, not en Authority refused the ground that surrogate mothe 1955. The Court certificates of id babies would be babies were issu India to gestatic ruled that, "In t are born in thi meaning of sec Then, the Unio Germany. Ger authorities. Th question whic consideration adoption pro supervised by However, the

²⁸ AIR 2010 Gu
²⁹ <https://www>

law, but it did not rule against their validity either. It elaborated on the concept of surrogacy, methods of surrogacy and recognised all forms of surrogacy, including altruistic and commercial. While not really ruling on the validity or enforceability of any aspect of surrogacy contracts, the Supreme Court recognised that surrogacy arrangements existed in India for various reasons.

*Jan Balaz v. Anand Municipality and 6 Others.*²⁸ This case is a presage of the complications that may arise out of cross border surrogacy agreement and highlights the urgent need for a legislation to regulate these agreements. The father of twins filed a petition before the court. The babies were conceived through the fertilization of a donor egg with the genetic father, because the intended mother was unable to produce eggs due to health conditions. The intending parents were German nationals, working in Great Britain. The donor too was an unknown Indian female. The issue in this case was of what country the babies were going to be citizens as the German Government refused to give the citizenship to newly born babies in India through surrogacy, as the surrogacy was not recognised in Germany. However, even the Indian Passport Authority also denied Passport to the new born babies, on the ground that children are not Indian citizens and therefore, not entitled to get Passport under the Indian Passport Act. The Regional Passport Authority refused to issue passports to the twins. This was later challenged by the Petitioner on the ground that the twins were Indian citizens by virtue of their birth in India to an Indian surrogate mother and thus entitled to Indian citizenship under Section 3 of The Citizenship Act, 1955. The Counsel of Jan Balaz argued that in exceptional cases passport Authorities can issue certificates of identity as was done in the case of Baby Manu Yamada. The court ruled that the babies would be issued passports. However, India does not allow dual citizenship, therefore the babies were issued overseas Indian Passports. The Court further observed that, the babies born in India to gestational surrogates are Indian Citizens and are entitled to Indian Passports. The Court ruled that, "In the instant case, the identity of the two babies has already been established, they are born in this country to an Indian surrogate mother and hence citizens of India within the meaning of section 3 (1) (c) (ii) of the Citizenship Act."²⁹

Then, the Union of India responded that India shall make all attempts to have the children sent to Germany. German authorities have also agreed to reconsider the case if approached by the Indian authorities. These are the efforts taken by the authorities as the fate of the newly born child is in question which undoubtedly needs to be resolved on an urgent basis and by taking into consideration the interest of the child. So, the babies were allowed to go home, through the adoption process by their parents. They had to complete the inter-country adoption process supervised by the Central Adoption Resource Agency.

However, the decision of the Indian Court has created confusion and many moral questions as

²⁸ AIR 2010 Guj. 21

²⁹ <https://www.arcgis.com/apps/Cascade/index.html?appid=43c616cb5fa54d009061b12d7d6c3c42>

the court has considered the egg donor and surrogate mother as a legal mother of the child and therefore granted nationality to the child. Does it mean the child has three mothers: the woman who has donated her eggs, the mother who carried the baby in her womb and the social mother that is the wife of the intended father?

Although in all the cases discussed above, the competent court permitted the transfer of parentage status to the intended parents, effectively affirming the parent-child legal status previously granted outside the country, not every case or country has been so flexible with its returning citizens. These uncertainties suggest the ongoing need to have a more cohesive and predictable international framework which at the same time respects the very different values and policies of many countries.

V. STEPS TAKEN AT INTERNATIONAL LEVEL FOR CROSS BORDER SURROGACY

In this regard, the ongoing Surrogacy Project of the Hague Conference dealing with the Private International Law Issues surrounding the Status of Children, including issues arising from International Surrogacy Arrangements, since 2011³⁰ is noteworthy. A revamping multidisciplinary conference on the topic "Cross Border Reproductive Care: Ethical, Legal and Socio-Cultural Perspectives" was held in Cambridge in December 2010. Presentations by great legal luminaries in this conference explored many of the critical issues and identified four primary categories of 'drivers' for patients seeking CRBC: (i) legal and religious prohibitions; (ii) resource considerations, such as cost, lengthy in-country waits or fewer available assisted reproduction facilities or treatments; (iii) quality, including success rates and safety concerns; and (iv) personal preferences, including patients choosing to travel abroad for cultural, family or privacy reasons.³¹

In July, 2011, the Council on General Affairs and Policy of the Hague Conference on Private International Law instructed its Permanent Bureau to consider the thorny questions arising from international, cross-border surrogacy (HCCH, 2011). The mandate 'requires the Permanent Bureau to gather information on the practical legal needs in the area, comparative developments in domestic and private international law, and the prospects of achieving consensus on a global approach to addressing international surrogacy issues' (HCCH, 2011). No proposals have been suggested to date; not surprising given the enormity of the task.³²

³⁰ For more details, see <https://www.hcch.net/en/projects/legislative-projects/parentage-surrogacy>.

³¹ Susan L. Crockin, "Growing families in a shrinking world: legal, ethical challenges in cross-border surrogacy", [https://www.rbmojournal.com/article/S1472-6483\(13\)00351-9/pdf](https://www.rbmojournal.com/article/S1472-6483(13)00351-9/pdf).

³² *Ibid*.

VI. CONCLUSI

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VI. CONCLUSION

Cross border surrogacy is a great challenge for Private International Law. It has created a lot of opportunities for many to build their families, a dream which was hitherto impossible. But, one cannot oversee the possibility of cross-border surrogacy leading to exploitation of some. There is no similarity in the legal structure of many countries which is causing a great threat to the interest of all the parties of the surrogacy agreement. Therefore, the researcher strongly believes that rather than being deterred by legal, sociological, cultural and political controversies we should have statutory instruments based on minimum consensus between the concerned countries. This shall take into consideration the ethical, social and cultural differences of the countries in this new reproductive era. At the same time one shall take serious note of the fact that as "human form" is directly involved in this technology, paramount consideration shall be given to the interest of 'woman' and 'child'. On the line of the decisions delivered by the European Court of Justice, there must be some consistency between the practices of different States.

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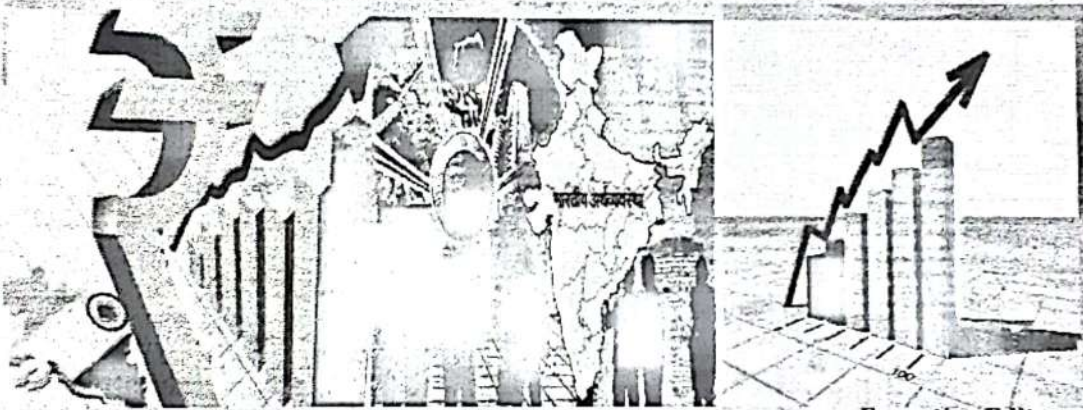
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Gender Equality And Religious Freedom Of Women In India

Dr. Pratima R. Lokhande^{1*}

Gender justice is indispensable for development of human progress. During the past century there are tremendous advancements in society, still women are not treated equally and also not afforded opportunities. They are always kept at the peripheries of economic, political, social, religious, and cultural rights. Women constitutes one of the prominent minorities in India and globally seen as vulnerable group. The issue of gender equality has always been taken a back seat when seen through religious freedom. Women are a victim of inequality and injustice in guise of religious freedom. Women's rights are often violated in the name of religious freedom. Nevertheless there is a shift in the approach through Indian judiciary. The Apex Court of India has given a new meaning to social inclusion of women and recognized religious freedom. In this backdrop the researcher highlighted two historic judgments of Supreme Court on Triple Talaq and Sabarimala Temple case, where the Apex court attempted to balance gender equality and religious freedom of women in India.

The fight for gender equality got a major boost when on 22nd August 2017 the Supreme Court passed a judgment which made the practice of instant Triple Talaq (Talaq-e-biddat) unconstitutional. This judgment is further followed by the Muslim Women (Protection of Rights on Marriage) Bill Passed by Lok Sabha on 28th December 2017. Another ruling on Sabarimala Temple in Kerala that had barred women aged 10 -50 from entering, on 28th September 2018 the Supreme Court allowed women of all ages to enter the temple. These recent reforms are very important to uplift the status of women in society. Through these cases gender inequality is challenged through a social movement in the direction of change. Constitution of India recognizes human equality but the social reality is far from the ideal. Social change is possible only when it is supported by legal measure. Reformation of society with reforming law is an aimless effort. Social transformation is a result of legal change.

SABARIMALA TEMPLE CASE:

Sabarimala which is one of the largest Hindu Pilgrimage in Kerala barred women between 10 to 50 from entering temple. The ban on women is listed in Kerala Hindu Places of Public Worship (Authorization of Entry) Rules of 1965. In the year 1990, S. Mahendran filed plea in Kerala high Court for banning women's entry to temple. Kerala High Court also upholds restriction on women of a certain age group.

In the year 2006, Indian young Lawyers Association (IYLA) filed a petition in the Supreme court on the ground that the rule violates the freedom to follow and propagate religion.² On November 7, 2016 LDF government tells the Apex court that it favours entry of women. Finally on October 13, 2017 case is referred to Supreme Court Constitution Bench. Plea was filed in Supreme Court for gender equality bench to hear the case. Five Judge Constitution Bench started hearing the matter. Mean while, temple authorities made it mandatory for female devotees to furnish their age proof. Supreme Court made it clear that the ban on entry of women could be tested on the constitutional values. On September 28, 2018 Supreme Court allowed women of all age group to enter the temple. Any rule or custom barring women is violative of Article 25

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² Article 25 of the Constitution of India



(clause 1)³ and rule 3 (b) of Kerala Hindu Places of worship. A 4:1 majority held that temple practices of excluding women are unconstitutional. It was held that the practice violated the fundamental right to equality, liberty and freedom of religion.

This above-mentioned judgment is in the spirit of article 51-A⁴. It also develops the spirit of inquiry and reform. It denounces practices derogatory to the dignity of women. Sabarimala judgment is indeed bold and empathetic. It looks from the perspective of women who are often the victim of a social dictate. This judgment is in consonance with fundamental constitutional value. It is very important to balance religious group rights and individual rights.

In this backdrop, it is submitted that courts consistently supported rights of women saying that tradition cannot take precedence over the Constitution. The discrimination of women endangers gender equality. Strong message has been sent to religious authorities that places of worship neither can nor discriminate against women. Dr. B.R. Ambedkar said that, public temples, public roads are meant for the public with no discrimination on any ground whatsoever. The right of the religious authority under Article 26(b)⁵ cannot take precedence over women's freedom under Article 25 (1). Sabarimala case is thus not a religious issue but gender issue. This verdict ruled in favour of women, it is about women's right. Religion cannot come above the constitution. We live in a democratic country where everyone is said to be equal. This case is not about one temple and legal right of women, but this case represents conflict between women, religion and state.

BACKGROUND OF TRIPLE TALAQ CASE:

In India, high profile case was filed by a Muslim woman Shayara Bano⁶ who was a victim to talaq-i-biddat, or 'triple-talaq. In a PIL it was stated that, Triple Talaq and polygamy have been restricted by many Islamic Countries. But such practices are still continued in India. Hence these practices should be declared as illegal, unconstitutional, Un-Islamic and violative of fundamental right to equality and liberty under the constitution of India.

The petitioner Shyara Bano also approached the Court as her husband Rizwan Ahmed pronounced divorce in presence of witnesses saying that, I gave Talaq Talaq Talaq. From this day there shall be no relation as a husband and wife. Hence petitioner sought declaration that talaq-i-biddat pronounced by her husband should be declared as void- ab -initio. She contended that such kind of divorce terminates the ties of matrimony abruptly, unilaterally and irrevocably under section 2 of the Shariat Act⁷ and hence be declared unconstitutional. In the petition she stated that talaq-i-biddat pronounced by her husband is not valid as it is not the part of Shariat (Muslim Personal Law). The Government of India has also filed affidavit in the case and stated that, within the meaning of Article 13 of the Constitution of India, Muslim personal law is a Law. In this case

³ Clause 1 states Freedom of conscience and free profession, practice and propagation of religion, Subject to public order, morality and health and to the other provisions of this Part, all persons are equally entitled to freedom of conscience and the right freely to profess, practise and propagate religion

⁴ (c) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

⁵ Freedom to manage religious affairs Subject to public order, morality and health, every religious denomination or any section thereof shall have the right (b) to manage its own affairs in matters of religion;

⁶ Shayara Bano v. Union of India (2017) 9 SCC 1 p.352

⁷ Muslim Personal Law (Shariat) Application Act , 1937



Indian Supreme Court ruled that the practice of Triple Talaq is unconstitutional and declared as invalid.

CONCLUSION:

In the present context Indian judiciary has become crusader of gender equality. Courts are allowed to interfere in religious freedom and guarantee gender equality. Religious freedom does not include the right to discriminate on the basis of gender. If gender equality is not ensured the Indian women will continuously live in a unacknowledged and unfulfilled fear. Through Sabarimala and Shayara Bano case, the Supreme Court of India has established the values of gender equality and women emancipation against all forms of discrimination.



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“Cyber Crime: A Barrier to the Road of Success to E- Commerce in India”

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Abstract

In India Commerce is getting a new sphere and dimension. The word commerce refers to buying, selling, trading and advertising and all transactions which lead to an exchange of value between two parties. In internet age, it is shifted from its old physical market to electronic market i.e. E-commerce. E- Commerce involves transactions of money and information. Both of these components are of great importance for the business. Our society is developing with e-commerce; in the meantime cyber criminals are taking advantages from it. E- Commerce is increasing worldwide. The growth of E- commerce is suffering from cyber crime. Different forms of cyber crime are creating obstacles in the growth of e commerce business in India. This paper analyses most common and prevalent types of cyber crime in digital era. This paper also attempts to explore E-commerce evolution in India and its impact on business. This paper draws attention to various crimes and preventive and legislative measures to cyber crimes.

Key words: E-commerce, E-business, Cyber Crime, Cyber criminals

INTRODUCTION:

In a developing country like India, computers and internet enabled business organizations to execute their e-commerce business. E-commerce is the extension of traditional business operations to electronic space. It is a medium to conduct manage and execute the business transactions using computer and telecommunication networks. E-Commerce offers borderless medium which is not targeted to specific geographical market. E-commerce provides platform and access to even small business to market and internet users worldwide by creating commercial websites. E- Commerce has the access to global market place. E-commerce is a new way of conducting online business where manufacturer can directly connect with the end consumer. It has enabled the businesses to increase internal efficiency and to expand their

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operations globally. Electronic commerce conducting business online reveals that in future E-commerce is a key driver for Indian economy. Internet technologies enabled the interaction between business and public sector. In India electronic commerce has witnessed tremendous growth in the recent years. Internet and technology offered various advantages. It is convenient, time saving and ensures availability of options with low prices as compared to traditional business. It has improved the efficiency and effectiveness of business. E-commerce has connected people and has become back bone of world economy. For the ideal electronic world there is a need to develop techniques to protect the system and regulate cyber world. The technology in cybercrime world is becoming more and more advance. E-commerce has shaped business practices in such a manner that there are no limitations of territorial boundaries as well as actual presence at the same place. Online and e-commerce activities is becoming part and parcel of the internet users. Cyber crime has become the matter of great concern for the business firms and consumers. Computer and internet are used for committing cyber crime. The word Cyber is related to internet or other electronic networking devices and crime means a criminal activity². Cyber crimes are computer generated crimes where a computer may be a tool or target. Cyber crime poses great threat to online security. Cybercriminals steal valuable financial information from innocent internet users every year. Attacks on the computer systems through malware or malicious software and getting access to the sensitive information stored in it, without the knowledge of users is the most common crime committed by the cyber criminals. Cyber criminals use computer system to involve themselves in the unlawful and illegal acts. Some of the examples of the cybercrime are cyber stalking, phishing and credit card number thefts etc. where the illegal activities are committed through computer and the internet. It brings serious threats to the integrity and existence of the businesses. There are various other cybercrimes which have a serious impact on business organizations and on E-commerce. Cyber space is the most eminent place for e-commerce, business, information and many more. But due to the manipulative mind of some cybercriminals this cyber space is used for committing cyber crime.

ENACTMENT OF INFORMATION TECHNOLOGY ACT, 2000:

It is needless to mention that Internet and technology has various advantages but it also has terrible downside. Information Technology Act, 2000 (Amended in the year 2008) is enacted in India for the socio economic development of our country with an intention to promote e-commerce and e-governance in the country. The I.T Act, 2000 contains various provisions to strengthen the legal mechanism for electronic commerce.

AN OVERVIEW OF CYBER CRIME:

The word cyber crime means variety of criminal acts and offences and unlawful activities connected with computer. As number of critical transactions are carried out by computer systems

²According to Oxford Learners dictionary cyber crime means, "connected with electronic communication networks, especially the internet."



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over networks. There is an internet security threat. E- Commerce transaction suffers significant financial and information losses due to increasing cyber crime. The word computer means performance of magnetic, electronic, optical function with high speed data processing device or system. It has arithmetic and memory functions. It also includes processing, storage, computer software, or communication facilities which are connected to the computer in a computer system or computer network.³The author has discussed types of crimes which poses threat to electronic commerce. Some of these crimes against individuals and business organizations are enumerated and briefly explained below:-

➤ CYBER STALKING

Cyber Stalking is an extension of the physical harm. It involves written, verbal or implied threats to cause a reasonable fear in the mind of victim. Persistent messages are sent to an unwilling recipient. Cyber Stalking includes harassment to the victim. The internet technology is used against other individual or business organizations for harassment. It is mainly used for damaging data or equipment, and gathering personal information for harassment purposes.

➤ HACKING:

Hacking is the most popular type of crime. It means unauthorized access to the other computer system or network so that important information can be accessed⁴. This involves use of variety of criminal software by hackers to gain access of a person's computer without his consent. There is a difference between ethical hacking and hacking. Hackers steal private information like credit card numbers, account numbers, confidential information stored in the hard disk of the computer.

➤ PHISHING

Phishing is used for gaining information through misrepresentation. It is an attempt to defraud the user to provide private and sensitive information that will be used for identity theft. Users are directed through the mail to visit a web site where they are asked to update personal information, such as passwords and credit card, and bank account numbers that the legitimate organization already has. The Web site is not genuine and just set up only to steal the user's information.

➤ MALWARE AND MALICIOUS CODE:

Malware means malicious Software. It is definitely a security threat for e commerce. Under information Technology act detecting malware is one the major problem. It refers to any malicious program that causes harm to a computer system or network. Malware and Malicious code attacks a computer or network. Network disruption is the main aim of malware .This software is used to gain access to system and steal sensitive information or Data which damages the software incorporated in the system.

³Section 2 (I) of information Technology Act, 2000

⁴ Section 66 (1) of Information Technology Act, 2000



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➤ E-MAIL

Electronic mail is one of the most popular and convenient mode of communication. It can be modified, changed and altered by the interloper. It is a form of net abuse comprising of sending large number of e-mails to an address. This is an attempt to flood the mail box or block the server.

➤ WEB JACKING:

Web Jacking is a cyber crime used for gaining access and taking control of others website. By the method of web jacking, the hackers can disfigure and change the information on the site. It involves taking control of a website by cracking the password whereby the actual website owner loses the control over website.

➤ IDENTITY THEFT

This kind of cyber crime produces a greater threat to the people those who are using computer for online banking transactions and other online services. In this kind of crime credit card and debit cards of the customer is used to steal money and also to buy things through their bank account. It also steals individuals other personal and sensitive information. This result into major financial losses .It even erases the credit history of the customer.

➤ DATA THEFT:-

It means stealing of data for illegal usage. Data theft occurs when a person violates copyrights and steals music, movies, games and software. This type of crime is costing the copyright industry a huge loss. The stronger laws are required to prevent people from unlawful downloading.

➤ DATA DIDDLING:-

This kind of crime involves changing of data prior or during input into a computer. The information is changed from the way it should be entered by a person typing in the data, a virus that changes data, the programmer of the database or application, or anyone else involved in the process of having information stored in a computer file. It changes the financial information.

➤ VIRUSES:

Virus is a computer program that can infect other computer programs. Viruses are the programs that attach themselves to the computer file and then circulate it to the other files and computer network. It affects the data on computer by altering or deleting it. A worm is also a program



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which propagates itself over a network by reproducing itself.⁵ Worms are found in networks where they infect all the computers connected to the main server.

It appears from the above-mentioned cyber crimes that open and unregulated nature of internet provides fertile ground for cyber criminals. Cyber crime counts are increasing day by day. It encompasses broad range of illegal activities. Indeed it is quite probable that there is an urgent need to provide appropriate measures for the punishment of the offenders. There are technical as well as legal challenges before the law enforcement machineries.

CONCLUSION:

New age brings new kinds of crime and in the internet age cyber crime is damaging the cyber space. To secure electronic commerce transactions between organizations, consumers and public authorities, strategic legal mechanism is essential. Our country has adequate legislation in place; if such legislation is effectively implemented and enforced it may increase users confidence in e-commerce, e-transaction laws and data protection. Government has enacted relevant laws and policies to promote cyber security. Corporations and other large institutions have also established various strategies in response to threat through the internet. It involves software for access control through firewalls and content control. Authentication includes use of biometrics and smart tokens. Authorization includes user's rights and privileges. Integrity checking software and antivirus is also created. In addition to it, provisions for cryptology is incorporated under Information Technology Act, 2000 which includes digital signatures, electronic signatures and legal recognition of electronic data. In today's technology environment organizations are becoming more and more dependent upon information system. It is therefore important aspect to worry about the information security. The value of the business is concerned with the value of the information. Information technology is nothing but the collection of technologies, techniques and standards and management practices that are applied to the information to keep it secure. Thus information security requires security measures and strict control to provide security for electronic commerce transactions. All the internet users must take some preventive measures to save themselves from an evil of cyber crime. First and foremost thing is vigilance. It is essential for the organizations and individuals to know the techniques used by the cybercriminals to avoid cyber crimes efficiently.

⁵Section 43 of Information Technology Act, 2000. It covers the introduction of viruses.



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“The Issues of Trademark Infringement in E-Commerce Regime”

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Abstract

In the current digital world, where the plethora of information is available on single click, the area of intellectual property also gained the momentum. As the e-commerce is booming in present economy, people prefer their dealings of buying and purchasing through electronic medium to save the time. However, with every pro come the cons. In this e-commerce regime, there is certain major issues infringement and deception which should be handled on priority is falling in the domain of Trademark. As on every occasion both Trademark and e-commerce are intersecting with each other, various malpractices of selling counterfeit goods, passing of goods and services belonging to another owner, falsely providing the description of the products etc. are on rampant in present era. Therefore, author needs to analyse all these issues of trademark infringement with appropriate solution to address these issues through this paper.

Keywords: E- Commerce, Intellectual Property, Infringement, Counterfeit, Unfair Competition.

1. Introduction

Merriam Webster has made an attempt to define the term E-Commerce, according to him e-commerce refers to that activity that is related to purchasing and selling of goods and services over the internet¹. This made easy for the people to purchase the essentials from their place with just single clicks instead of physical purchase. In order to purchase online one should need to know the websites providing the platform for online shopping. There are various apps like Amazon, Mantra, Club factory, Flipkart, Swiggy, Uber, Snapdeal, Trivago, Urban clap, etc which are largely in practice into contemporary era.

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Intellectual property on the other hand refers to that property which you have created by using your intelligence. In other words Intellectual property is that property wherein someone creates the things by using their intellectual like inventions, literature, artistic works, designs, symbols, names and which has a commercial value in commerce². On various points it found that IP is important in the field of E-Commerce and vice versa.

IMPORTANCE OF INTELLECTUAL PROPERTY IN E-COMMERCE.

Following points clearly reveals how IP is important in E-Commerce-

1) IP Protects unfair competition:

Intellectual property law protects against disclosure of trade secrets, copying of the material belong to another person, using the similar technology without license etc. An intellectual property law provides protection against all unfair practices done by the competitors in the field of digital economy. If there were no intellectual property statutes, there would have been no new creation of works. Without IP, the original unique work belong to one is susceptible to get stolen without paying any cost to its creator for his labor.

2) IP facilitates trade:

In the digital world plethora of information is available on internet and various giant companies are preferring to sell the goods and providing services online where the consumers gets the variety of choices for purchase. This transaction of selling and buying involvestechnological conveyance, trade names, designs and its licensing cumulatively responsible for facilitating trade.

For example- MP3 songs, Movies, various software's, designs, books, journals, articles, housewares etcare traded through E-Commerce, in which intellectual property act as a main inseparable component³.

3) It helps in making E-Commerce viable.

In order to set the e-commerce in Motion, it requires technological systems that allow the Internet to function because in absence of any technology there is a huge difficulty to connect the producer and consumer. For this the developed software's, networks, routers, the user interface are required which are nothing but the subject matter of intellectual property like patents, designs, and often protected by law of land.

4) Trademark secures essential element in E-Commerce.

Trademarksecures one of the essential components of E-Commerce. This is because all the instances of brands for different items like clothing, articles, cosmetics, confectioneries,



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furniture's, utensils and many more other products which are available online for customer recognition and good will are protected by provisions given under trademark legislation and unfair competition laws in India.

5) **Licensing Intellectual property creates the base for E-Commerce.**

As the intellectual property is one of the main components of E-Commerce facilitates the trade by granting IP licensing especially Patent and TM licensing which forms the basis for e-commerce. This is because various innovative technologies under unique trade names are involved for creating a product that companies often outsource or share through licensing arrangements. The economics of E-Commerce depends on the involvement of various companies' works together by sharing the technology and knowhow through licensing of intellectual properties involved in it. This creates the business opportunities and helps in catering out the risks of business⁴.

The above points made it clear that we cannot forget the importance of Intellectual properties in the e-commerce era as it relates to each other on many aspects. However, with this positive aspect, we cannot deny the possible threats which are posing on the very existence of IPs. Intellectual Property in E-Commerce is most important inseparable of E-Commerce but it is perhaps the neglected on many areas of IP especially when it entangled with trademark.

Therefore it is worth mentioning that, the protection of trademark in the digital mode has been facing the variety of threatening issues and the challenges of trademark infringement.

TRADEMARK ISSUES IN E-COMMERCE.

The common trademark issues faced all over the globe in the digital commercial world has been mentioned as under-

1. SELLING OF COUNTERFEIT GOODS IN ONLINE MODE:

Trademark infringement and counterfeiting of the original goods has been an alarming problem for renowned brands. There are so many instances where the person is purchasing some product online and while delivery of the product receives counterfeit product. The material utilized for the manufacturing such goods are generally seen to be of inferior quality. Counterfeiting amounts to the act of pirating the original product by unauthorized using the goodwill and reputation of branded trademark. In the end, counterfeiting and pirating the famous brands are responsible for dilution of the trade owner's reputation and goodwill in the market, because the consumers who incline to purchase the product may be of the opinion that all the products



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manufactured by the actual brand owner are inferior and worthless to purchase for the defined price in the market⁵.

For Example: Several suits have been filed in the courts by consumers and reputed companies against the sellers of fake and pirated products. Previously, companies like Tommy Hilfiger, Lacoste, Celine Paris and Calvin Klein have helped confiscate thousands of fake apparels through court-aided raids on warehouses, owned by either sellers or fashion portals⁶.

2. TO DETERMINE JURISDICTIONS:

The most prominent issue of IP in e-commerce is the determination of Jurisdiction. In the e-commerce, the multiple parties are involved from various parts of the globe that have only a virtual nexus with each other. In presence of such threatening issue, if the either party wishes to file a case against another, the prime question is common that which court could be appropriate for instituting suit? From this the problem of territorial jurisdiction arises. Traditionally, since the inception the jurisdiction is canvassed through two areas-

1. The place where the defendant resides or the place of carrying business.
2. The place where the cause of action arises.

However, in the transactions of individuals through online mode, the traditional ways of determination of jurisdictions are difficult to establish. As it is difficult to decide the jurisdiction merely on the basis of the shipping address provided by the consumer while placing online order for purchase.

In this backdrop there is a case of **Impresario Entertainment & Hospitality Pvt. Ltd. Vs. S&DHospitality⁸**, the question of jurisdiction is involved wherein, the defendant contended that the act of placing an order online is insufficient to say that any transaction took place since the beginning of transaction is not the same place where the booking done. However the court has clarified that any act of accessing the defendant's website at any place is not sufficient enough to determine that the Court can exercise its jurisdiction on arousal of any dispute.

3. SELLING DEFAULTED GOODS:

Another possible issue pertaining to trademark is the instance of selling defaulted goods online. The defaulted goods are that which are sold by breaching the trademark license agreement which enables the licensee to sell the goods directly or to be sold in a certain regional territory only ; or selling products through online mode with the condition that same should be sold in certain occasions strictly as directed by the trademark owners. The present law enacted by the legislature does not mention whether such acts are legitimate or illegitimate. Presently, the owners of



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reputed brands are still facing many problems in conveyance of their exclusive right through granting license for the use of their trademark in the digital commercial world⁹.

4. USING OTHERS' TRADEMARKS:

The most threatening problem commonly seen in the e-commerce is infringement of the trademark. The most viable infringement of trademark is committed by using identical or similar trade name, trade description, logos and advertisements belongs to another without permission. There are bundles of cases on infringement are still pending in the courts which requires the special attention to determine, whether the use of identical or similar mark is fair and legal; or instead will this act are responsible to cause confusion to the public, and whether such use will responsible to cause damages to the reputation and goodwill of original trademark owners.

For example: Metro Shoes, a multi-brand retailer of footwear's in India has filed a trademark infringement case against Flipkart, an Indian e-commerce legend in Bombay High Court for selling shoes under the brand name Metronaut. They further alleged that such act creates confusion to consumer that both are the similar brands and belongs to same proprietor.

5. USING OTHERS' TRADEMARKS AS DOMAIN NAMES:

A domain name is part of network address and location of a website on the internet in the digital world. For simple understanding, domain name is an address of a web site created by the owner of the brand with an intension to make it accessible for the consumers which is easy to remember, such as yahoo.com, sony.com, gmail.com etc¹⁰. The domain name has always been related to a trademark in many aspects. Recently, it is most prevalent practice that, anyone who owns a brand prefers to advertise the same brand by creating their website on the internet for easy access as a valuable addition to their business. Therefore, all the reputed brand owners has legal and genuine claim on the same brand as their own domain name. That is why the legislature while enacting a law made it mandatory that no two domain names can be identical because it apparently creates confusion to the consumers with regard to the ownership and origin of goods and service. The ignorance of the same law is responsible for defeating the principal of trademark law of the land¹¹. But, despite the said provision there are so many instances in which we found the blatant violation of said law in present scenario.

For Instance: In *Rediff Communications Ltd. v. Cyber tooth & Another*¹²

This is a land mark case on the Domain name in which the Bombay High Court has granted an injunction prohibiting the defendants from using the domain name 'RADIFF' to their business and also restricting any other similar name which causes confusion to the consumer and deceive them to believe that both domain names are belong to one common source.



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Furthermore, the honourable Delhi High Court allowed the petition of wherein domain name Naukari.com was in question. The court restrained the defendant from using the website with the domain name, 'Naukari.com' which was held to be confusingly similar to that of the plaintiff, 'naukri.com', with a different variants and held that the same has been sufficient enough to establishing prima facie inference of bad faith¹³.

CONCLUSION

To summarize, the issues relating to trademark infringement in digital mode has developed and changed rapidly with the continuous innovations of e-commerce. As the field of trademark and E-Commerce are mainly associated with each other, therefore it is worth to keep long-term attention on the appropriate application of the laws for the protection of Intellectual property in digital environment. As the E-Commerce in conjunction with Intellectual Property is the subject matter of a dispute, to address this, an international approach is required to tackle such issues. In order to address the problem of identifying the infringers in e-commerce environment there are several ways to solve this issue by-

1. Obtaining information regarding internet real name authentication.
2. Obtaining information regarding operators of relevant websites, domain name.
3. Obtaining the sellers information through sample purchase.

Various common law precedents exist, which aid in protecting Intellectual Properties through various theories such as that of 'minimum contacts' or 'long arm statutes'. Though India is yet to adapt these theories and methods, it will help the judicial system to refer it because these methods have originated from countries having the comparatively strong base of Intellectual Property protection. The Indian scenario is expected to witness many more litigation in this domain in the near future and it would be of great contribution when judiciary explores and interprets the unexplored grey areas in this field where the E-commerce clashes with Intellectual Property.

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DEVELOPING AND BENCHMARKING BEST PRACTICES FOR QUALITY ENHANCEMENT IN HEIS

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Abstract:

The unique practices of every educational institution and each department or component that makes the whole of an educational institution can be termed as Best Practices. When these Best Practices are followed as a matter of course and finally acquire the quality mark of being institutionalised we may call them as Quality benchmarks of an Institution.

The practices add significant value to an institution and its various Stakeholders. If we simplify this process, it is easy to see that Institutions that strive to achieve excellence in the dissemination of Quality education can do so if they consistently follow different best practices at all levels and fulfil the requirements of each criteria set out by NAAC. The National Assessment and Accreditation Council (NAAC) has been constantly advocating the best practices benchmarking approach for quality enhancement in higher education.

Introduction:

The NAAC sets out criterion of assessment and uses these criterion to benchmark the Best Practices. It then also assesses the performance level of the Institutions through this method. The best way to achieve the best practice bench marking is to use them consistently and identifying processes which are generic, relevant and effective irrespective of the organization and its structuring. This way benchmarking across sectoral boundaries becomes possible. The overall purpose and intent of the Best Practices benchmarking can be summarized as the: Development of an understanding of the fundamentals that lead to success, The idea is to focus on continuous improvement efforts, and consistently manage the overall change process to close the gap between an existing practice of the institution and that of the best-in-class institutions with reference to the most relevant key performance variables.



The NAAC has created the Four I and D Model to earmark the following stages in the application of Best Practices:

1. Identification of best practices
2. Implementation of best practices
3. Institutionalization of best practices
4. Internalization of best practices
5. Dissemination of best practices

1. Identification of best practices

How to identify the Best Practices? Many variables have to be considered. These are institutional goals, pedagogic requirements, global concerns, local contexts, nature of learners competencies of staff, infrastructure facilities and governance requirements. An Institution has to consider all these and more while identifying the best practices. Peter Drucker rightly

observes that there is an incongruence between how we teach and how students learn. All these add to the complexity of choice of best practices. Then there is the danger that what any Institution considers as 'best practices' may be limited in a number of ways because what we consider to be the 'best' education practice depends on our own limited knowledge, perspectives, contexts, interests and values. Other Institutions or experts may not accept the same to be Best Practices since their perception and knowledge may be different. In this situation, many of the assumptions on which an Institution has worked out Best Practices will not hold. Another way to look at this is that 'best practices' are dependent on certain conditions and contexts and therefore may be unique to that Institution. Therefore for the Best practices to be relevant, it is necessary to identify the ones that are so relevant as to be clearly seen to contribute to value addition to the institution or the stakeholders. Hence, it is clear that there cannot be a 'one size fits all' mode of identifying Best Practices. The input factors, the process factors and output factors should be taken into account while identifying the criteria of best practices. The criteria of economy, efficiency and effectiveness may also be used in identifying them.

The International Network of Quality Assurance Agencies in Higher Education (INQAAHE) suggested some guidelines for the identification and application of good practices. The best practices should:-

- be dynamic and revisited periodically;
- recognize diversity and cultural and historical contexts;



- not lead to dominance of one specific view or approach; and
- promote quality of performance.

These principles should be interpreted and applied appropriately to different contexts, while identifying the practices.

Implementation of best practices

The implementation is the Achilles heel for every Institution. The reason being that academicians constantly debate and discuss and consider their own conclusions as the last words of wisdom. What is required is to move from words to action. “Talk is talk; action on the field is action on the field” said Roy Hodgson. However it is equally true that Institutions face genuine limitations in the application of best practices. At the same time there is also a lethargy in implementing new methodologies to evolve best practices by the academicians. The implementation strategies for Best Practices according to Prof. V. S. Prasad (Director, NAAC) include planning, resource mobilization, capacity building, monitoring and evaluation.¹ Every Best Practice needs to be carefully planned to suit the particular institution or department’s pedagogy and needs, the resources to be mobilized within and from outside the Institution and the implementing stakeholders are to be properly equipped and made capable to implement it. Once the Best Practice is put into motion there has to be a regular monitoring and periodic evaluation so as to make it relevant and effective. To achieve quality therefore, there is a need to pay attention to details.

Institutionalization of best practices

Institutionalization is the process of making the best practices an integral part of the institutional working. It has been established through deliberations and discussions that most best practices are institution-specific and are mainly individual managed. Similarly, in most cases, that individual happens to be the leader or head of the institution.

Leaders as innovators have been the change agents in many institutions, mobilizing and ensuring the wide-spread support of the campus community for the best practices. While this approach has resulted in commendable improvement in the quality of institutions, continuance and sustainability of those practices depends mainly on individual initiative and runs the risk of disruption or half-hearted pursuit if and when the individual is displaced for any reason. If, however, such a practice is formalized in the sense in which



exams are made a formal requirement, individual identity will then be superseded by the anonymity of the function.

In other words, through institutionalization this risk can be circumvented.ⁱⁱ This type of success in institutionalising the Best Practices can be achieved only through the constant and consistent implementation of the same. This target though successful in many Institutions, can be best sustained by integrating it into the system gradually and by making it second nature to the functioning of the concerned unit or component that is implementing the Best Practice. Thus the ultimate objective of institutionalization is to make it more institution centric than leader or individual centric while at the same time make the best practices as a regular and normal practice.

Internalization of best practices

Internalization refers to making things a part of one's nature by conscious learning and assimilation. Internalization of best practices means making excellence an integral part of one's habit and nature.ⁱⁱⁱ If the Best Practice becomes unique to the Institution and becomes one of its defining characteristic, then it can be said to have become internalised to the Institution. It can thus become the 'ethos' or the 'tradition' of that particular Institution. This will further qualify the Best Practice as a value addition to that Institution and automatically place the Institution on the path of excellence in quality education that will sustain and develop as it progresses.

Dissemination of best practices

Application of best practices is the social responsibility of institutions which equally means that there is a social responsibility of dissemination of these practices for wider application in the system. It is necessary to build on experiences and reviewing the practices through discussions and also by borrowing ideas or methods to implement the best practices. Institutions therefore need to develop suitable strategies like database of good practices, review forums, recording evidences for success etc. to discuss within and among institutions. A healthy dialogue regarding the Best Practices needs to be established within the Institution and also among the Peer Institutions. Another important aspect is recording of the practices which is also a means of quality improvement.

Best Practices Benchmarking



There are various definitions to explain constitutes as the Best Practices Benchmarking. A group of leading high technology corporations of the USA sees a benchmark as ‘the best-in-class achievement which becomes a recognized standard of excellence against which similar things are compared.’ There is also leading exponent of the United Kingdom (UK) sees benchmarking as “...the structured process for learning from the practice of others, internally and externally, who are leaders in a field or with whom legitimate comparisons can be made”.^{iv} When we look at it from this angle, it is seen that a best practice which has become successful, is monitored continuously for improvement and brings about an overall change while also standing the test of competing with other peer institutions of better quality, can be said to have achieved its purpose and objective.

Best Practices Benchmarking in Higher Education

Benchmarking is both important and relevant to higher education because it provides external point of reference or standards to educational managers for evaluating the quality of the processes they manage. When this approach is taken, it becomes valuable for providing information to be used in the prioritization and decision-making processes of the institution. It replaces the run of the mill attitude with that of a goal oriented quality achievement attitude. Higher Education has had to constantly use benchmarks for its improvement at all levels while disseminating education. But again, heretofore it has been involved only with aspects of finance, staffing, academics and students.

Generally, it has been used to justify budgets, or for obtaining more funding. It has not been benchmarking quality and hence excellence was never the goal. In this background the introduction of benchmarking in Higher education at all levels and specifically in the assessment criteria culled out by NAAC has worked wonders in motivating every HEI to target quality enhancement. Applied thus, the bench marking of Best Practices goes a long way in systematically leading HEIs to innovate and implement practices that achieve quality enhancement in the education imparted therein. This has brought about a significant improvement in the provision of quality education.

The last word - Sustainability of best practices

The characteristics of best practices that contribute to success and sustainability may be identified. Some characteristics inherent in the practice which are worth mentioning include: (a) that there is relative advantage of the new practice over the preceding practice, (b) the current best practice is compatible to



the institutional goals and culture, (c) it is divisible and available ; d) it is simple to adopt; e) it can be easily communicated so that it is as easily accepted.

There are also institutional factors that are extrinsic to the practice but have a great impact on the sustainability of the practice and they include: a) the culture of the institution should support new practices, b) members of the institution must be committed to the new practices, c) practice should be institutionalised and d) there is a team spirit and ability of the members of the institution to work in small groups and they should also be ready to shoulder individual responsibilities to contribute to the effectiveness of the practice. How far the best practice under consideration is effective depends on all these factors.

To conclude, we can say that once a Best Practice is identified and implemented, the key ingredients that will make it sustainable would be institutionalisation and internalization.

Once a Best Practice is made the integral part of the Institutional working, it can be said to be institutionalised. Further when all members of the institution accept that best practice as an integral and regular part of their working, it would be said to be an internalised Best Practice.

A continuous dialogue, discussion, monitoring and evaluation leads to consistent improvement leading to the sustainability of the Best Practice.

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Non-Classical Thermoelasticity in a Half Space under the influence of a Heat Source

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ABSTRACT

A two dimensional problem for an infinite half space is formulated, to study the thermoelastic response due to the presence of a heat source varying periodically with time. The Lord-Shulman theory of thermoelasticity with one relaxation time is considered. The bounding surface is traction free and subjected to a known temperature distribution. Integral transform technique is developed to find the analytic solution in the transform domain by using direct approach. Inversion of transforms is done by employing Gaver-Stehfast algorithm. Mathematical model is prepared for Copper material and numerical results for temperature, displacements and stresses thus obtained are illustrated graphically.

Keywords: Thermoelastic; half-space; Lord-Shulman; heat source.

I. INTRODUCTION

Thermoelastic problems are used to study the thermal stresses in an elastic body under high temperature gradients. The problems of thermoelasticity are broadly classified into two categories, namely static and dynamic problems. The problems dealing with dynamic thermal stresses are fundamentally important in engineering processes and have paved the way for technologies which operate in high temperatures such as nuclear reactors, aerodynamic structures, etc. The classical coupled thermoelasticity theory finds its first mention in Biot [1]. In non-classical theories of thermoelasticity, the Fourier heat conduction equation is generalized with the introduction of one relaxation time obtained by Lord and Shulman [2]. Various authors [3-8] contributed to the problems on generalized thermoelasticity. Recently, a lot of interest has developed in fractional order theory of thermoelasticity [9-15].

In this paper, a non-classical thermoelastic problem in a half space with a heat source is studied. The bounding surfaces are free of all loadings and subjected to a known temperature distribution. Gaver-Stehfast algorithm [7-9] is used to invert the Laplace transforms. All the integrals were evaluated using Romberg's integration technique [10] with variable step size.

II. FORMULATION OF THE PROBLEM

Consider a homogeneous isotropic thermoelastic solid occupying the region $z \geq 0$ and $0 < r < \infty$. The z-axis is perpendicular to the bounding plane. The problem formulation is under the perview of Lord-Shulman theory of generalized thermoelasticity with one relaxation time. We shall assume that the initial state of the medium is quiescent at a temperature T_0 . The surface of the medium is free from mechanical loads and a known temperature distribution is applied. A

heat source is applied on the domain. Cylindrical polar coordinates (r, φ, z) are used.

The problem is thus two-dimensional with all functions considered depending on the spatial variables r and z as well as on the time variable t .

The displacement vector, thus, has the form $\vec{u} = (u, 0, w)$.

The equations of motion can be written as

$$\mu \nabla^2 u - \frac{\mu}{r^2} u + (\lambda + \mu) \frac{\partial e}{\partial r} - \gamma \frac{\partial T}{\partial r} = \rho \frac{\partial^2 u}{\partial t^2} \quad (1)$$

$$\mu \nabla^2 w + (\lambda + \mu) \frac{\partial e}{\partial z} - \gamma \frac{\partial T}{\partial z} = \rho \frac{\partial^2 w}{\partial t^2} \quad (2)$$

The generalized equation of heat conduction has the form

$$k \nabla^2 T = \left(\frac{\partial}{\partial t} + \tau_0 \frac{\partial^2}{\partial t^2} \right) (\rho C_E T + \gamma T_0 e) - \rho \left(1 + \tau_0 \frac{\partial}{\partial t} \right) Q \quad (3)$$

where T is the absolute temperature, ρ is the density of the medium, τ_0 is the relaxation time, Q is the heat source and e is the cubical dilatation given by the relation

$$e = \frac{u}{r} + \frac{\partial u}{\partial r} + \frac{\partial w}{\partial z} = \frac{1}{r} \frac{\partial}{\partial r} (ru) + \frac{\partial w}{\partial z} \quad (4)$$

$$\nabla^2 = \frac{\partial^2}{\partial r^2} + \frac{1}{r} \frac{\partial}{\partial r} + \frac{\partial^2}{\partial z^2} \quad (5)$$

The following constitutive relations supplement the above equations

$$\sigma_{rr} = 2\mu \frac{\partial u}{\partial r} + \lambda e - \gamma (T - T_0) \quad (6)$$

$$\sigma_{zz} = 2\mu \frac{\partial w}{\partial z} + \lambda e - \gamma (T - T_0) \quad (7)$$

$$\sigma_{rz} = \mu \left(\frac{\partial u}{\partial z} + \frac{\partial w}{\partial r} \right) \quad (8)$$

We shall use the following non-dimensional variables $r' = c_1 \eta r, z' = c_1 \eta z, u' = c_1 \eta u, w' = c_1 \eta w, t' = c_1^2 \eta t$,

$$\tau'_0 = c_1^2 \eta \tau_0, \sigma'_{ij} = \frac{\sigma_{ij}}{\mu}, \theta = \frac{\gamma (T - T_0)}{(\lambda + 2\mu)}, Q' = \frac{\rho \gamma Q}{k c_1^2 \eta^2 (\lambda + 2\mu)}$$

where $\eta = \frac{\rho c_E}{k}$, $c_1 = \sqrt{\frac{\lambda + 2\mu}{\rho}}$ is the speed of propagation of isothermal elastic waves.

Using the above non-dimensional variables, the governing equations take the form (dropping the primes for convenience)

$$\nabla^2 u - \frac{u}{r^2} + (\beta^2 - 1)e - \beta^2 \frac{\partial \theta}{\partial r} = \beta^2 \frac{\partial^2 u}{\partial t^2} \quad (9)$$

$$\nabla^2 w + (\beta^2 - 1) \frac{\partial e}{\partial z} - \beta^2 \frac{\partial \theta}{\partial z} = \beta^2 \frac{\partial^2 w}{\partial t^2} \quad (10)$$

$$\nabla^2 \theta = \left(\frac{\partial}{\partial t} + \tau_0 \frac{\partial^2}{\partial t^2} \right) (\theta + \varepsilon e) - \left(1 + \tau_0 \frac{\partial}{\partial t} \right) Q \quad (11)$$

while the constitutive relations (6)-(8), becomes

$$\sigma_{rr} = 2 \frac{\partial u}{\partial r} + (\beta^2 - 2)e - \beta^2 \theta \quad (12)$$

$$\sigma_{zz} = 2 \frac{\partial w}{\partial z} + (\beta^2 - 2)e - \beta^2 \theta \quad (13)$$

$$\sigma_{rz} = \left(\frac{\partial u}{\partial z} + \frac{\partial w}{\partial r} \right) \quad (14)$$

Here $\beta^2 = \frac{(\lambda + 2\mu)}{\mu}$

Combining equations (9) and (11), we obtain upon using equation (5),

$$\nabla^2 e - \nabla^2 \theta = \frac{\partial^2 e}{\partial t^2} \quad (15)$$

We assume that the initial state is quiescent, that is, all the initial conditions of the problem are homogeneous.

The thermal and mechanical boundary conditions of the problem at $z = 0$ are taken as

$$\theta(r, 0, t) = f(r, t), \quad 0 < r < \infty \quad (16)$$

$$\sigma_{zz}(r, 0, t) = 0, \quad 0 < r < \infty \quad (17)$$

$$\sigma_{rz}(r, 0, t) = 0, \quad 0 < r < \infty \quad (18)$$

where $f(r, t)$ are known function of r and t .

Eqns. (1)-(18) constitute the generalized thermoelastic formulation of the problem on axisymmetric half space.

III. SOLUTION OF THE PROBLEM

Applying the Laplace transform defined by the relation,

$$\bar{f}(r, z, s) = L[f(r, z, t)] = \int_0^{\infty} e^{-st} f(r, z, t) dt \quad (19)$$

to all the non-dimensional equations (9)-(18), we get,

$$\nabla^2 \bar{u} - \frac{\bar{u}}{r^2} + (\beta^2 - 1) \bar{e} - \beta^2 \frac{\partial \bar{\theta}}{\partial r} = \beta^2 s^2 \bar{u} \quad (20)$$

$$\nabla^2 \bar{w} + (\beta^2 - 1) \frac{\partial \bar{e}}{\partial z} - \beta^2 \frac{\partial \bar{\theta}}{\partial z} = \beta^2 s^2 \bar{w} \quad (21)$$

$$(\nabla^2 - s - \tau_0 s^2) \bar{\theta} = (1 + \tau_0 s) (\varepsilon s \bar{e} - \bar{Q}) \quad (22)$$

$$(\nabla^2 - s^2) \bar{e} = \nabla^2 \bar{\theta} \quad (23)$$

$$\bar{\sigma}_{rr} = 2 \frac{\partial \bar{u}}{\partial r} + (\beta^2 - 2) \bar{e} - \beta^2 \bar{\theta} \quad (24)$$

$$\bar{\sigma}_{zz} = 2 \frac{\partial \bar{w}}{\partial z} + (\beta^2 - 2) \bar{e} - \beta^2 \bar{\theta} \quad (25)$$

$$\bar{\sigma}_{rz} = \left(\frac{\partial \bar{u}}{\partial z} + \frac{\partial \bar{w}}{\partial r} \right) \quad (26)$$

$$\bar{\theta} = \bar{f}(r, s) \quad (27)$$

$$\bar{\sigma}_{zz} = \bar{\sigma}_{rz} = 0 \quad (28)$$

Eliminating \bar{e} between the equations (22) and (23), one obtains,

$$\left\{ \nabla^4 - (s^2 + s(1 + \tau_0 s)(1 + \varepsilon)) \nabla^2 + s^3(1 + \tau_0 s) \right\} \bar{\theta} = -(1 + \tau_0 s) (\nabla^2 - s^2) \bar{Q} \quad (29)$$

After factorization the above equation becomes,

$$(\nabla^2 - k_1^2)(\nabla^2 - k_2^2) \bar{\theta} = -(1 + \tau_0 s) (\nabla^2 - s^2) \bar{Q} \quad (30)$$

where k_1^2 and k_2^2 are the roots with positive real parts of the characteristic equation

$$k^4 - (s^2 + s(1 + \tau_0 s)(1 + \varepsilon)) k^2 + s^3(1 + \tau_0 s) = 0 \quad (31)$$

The solution of Eq. (30) is written in the form,

$$\bar{\theta} = \bar{\theta}_1 + \bar{\theta}_2 + \bar{\theta}_p \quad (32)$$

where $\bar{\theta}_i$ is a solution of the homogenous equation,

$$(\nabla^2 - k_i^2) \bar{\theta}_i = 0, \quad i = 1, 2. \quad (33)$$

and $\bar{\theta}_p$ is a particular integral of equation (30).

In order to solve the problem, the Hankel transform of order zero with respect to r is used. The Hankel transform of a function $\bar{f}(r, z, s)$ is defined by the relation,

$$\bar{f}^*(\alpha, z, s) = H[\bar{f}(r, z, s)] = \int_0^{\infty} \bar{f}(r, z, s) r J_0(\alpha r) dr \quad (34)$$

where J_0 is the Bessel function of the first kind of order zero and α is the Hankel transform parameter.

The inversion of Hankel transform is given by the relation

$$\begin{aligned} \bar{f}(r, z, s) &= H^{-1}[\bar{f}^*(\alpha, z, s)] \\ &= \int_0^{\infty} \bar{f}^*(\alpha, z, s) \alpha J_0(\alpha r) d\alpha \end{aligned} \quad (35)$$

Applying the Hankel transform to equation (33), we get,

$$\left\{ D^2 - (k_i^2 + \alpha^2) \right\} \bar{\theta}_i^* = 0, \quad i = 1, 2., \quad \text{where } D = \partial / \partial z \quad (36)$$

The solution of the above equation is written in the form

$$\bar{\theta}_i^* = A_i(\alpha, s) (k_i^2 - s^2) e^{-q_i z} \quad (37)$$

where $q_i = \sqrt{\alpha^2 + k_i^2}$

Applying Hankel transform to the equation (30), we get,

$$\begin{aligned} (D^2 - q_1^2)(D^2 - q_2^2) \bar{\theta}_p^* \\ = -(1 + \tau_0 s) (D^2 - q^2) \bar{Q}^* \end{aligned} \quad (38)$$

where $q = \sqrt{\alpha^2 + s^2}$

The periodically varying heat source $Q(r, z, t)$ in cylindrical co-ordinates is taken in the following form

$$\begin{aligned} Q(r, z, t) &= Q_0 \frac{\delta(r)}{2\pi r} \cdot \frac{\sin \pi t}{\tau}, \quad 0 \leq t \leq \tau \\ &= 0, \quad t > \tau \end{aligned} \quad (39)$$

where Q_0 is the strength of the heat source and $\delta(r)$ is the well known Dirac's delta function.

On applying Laplace transform and Hankel transform to equation (39), we get,

$$\bar{Q}^* = \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} \quad (40)$$

The solution of the equation (38) has the form,

$$\bar{\theta}_p^* = \frac{(1 + \tau_0 s) q^2}{q_1^2 q_2^2} \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} \quad (41)$$

Then the complete solution in the transformed domain is obtained as

$$\bar{\theta}^*(\alpha, z, s) = A_i(\alpha, s) (k_i^2 - s^2) e^{-q_i z} + \frac{(1 + \tau_0 s) q^2}{q_1^2 q_2^2} \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} \quad (42)$$

On applying the inverse Hankel transform to equation (42), we get,

$$\bar{\theta}(r, z, s) = \int_0^\infty \left\{ \sum_{i=1}^n A_i(\alpha, s) (k_i^2 - s^2) e^{-q_i z} + \frac{(1 + \tau_0 s) q^2}{q_1^2 q_2^2} \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} \right\} \alpha J_0(\alpha r) d\alpha \quad (43)$$

Similarly eliminating θ between equations (22) and (23), we get,

$$(\nabla^2 - k_1^2)(\nabla^2 - k_2^2) \bar{e} = -(1 + \tau_0 s) \nabla^2 \bar{Q} \quad (44)$$

On applying Hankel transform to equation (44), we get,

$$(D^2 - q_1^2)(D^2 - q_2^2) \bar{e}^* = -(1 + \tau_0 s) (D^2 - \alpha^2) \bar{Q}^* \quad (45)$$

Complete solution of equation (45) is obtained as,

$$\bar{e}^*(\alpha, z, s) = \sum_{i=1}^2 A_i(\alpha, s) k_i^2 e^{-q_i z} + \frac{(1 + \tau_0 s) \alpha^2}{q_1^2 q_2^2} \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} \quad (46)$$

Taking the inverse Hankel Transform to equation (46), one obtains,

$$\bar{e}(r, z, s) = \int_0^\infty \left\{ \sum_{i=1}^2 A_i(\alpha, s) k_i^2 e^{-q_i z} + \frac{(1 + \tau_0 s) \alpha^2}{q_1^2 q_2^2} \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} \right\} \alpha J_0(\alpha r) d\alpha \quad (47)$$

Applying Hankel transform to equation (21) and then using equations (42) and (46), the axial displacement component is obtained as,

$$\bar{w}^*(\alpha, z, s) = B(\alpha, s) e^{-q_3 z} - \sum_{i=1}^2 A_i(\alpha, s) q_i e^{-q_i z} \quad (48)$$

where $q_3 = \sqrt{\alpha^2 + \beta^2 s^2}$

On applying the inverse Hankel transform to equation (48), we get,

$$\bar{w}(r, z, s) = \int_0^\infty \left\{ B(\alpha, s) e^{-q_3 z} - \sum_{i=1}^2 A_i(\alpha, s) q_i e^{-q_i z} \right\} \alpha J_0(\alpha r) d\alpha \quad (49)$$

Applying the Hankel transform to equation (20) and using equations (42), (46) and (48), we get,

$$H \left[\frac{1}{r} \frac{\partial}{\partial r} (r \bar{u}) \right] = \left\{ \begin{aligned} & B(\alpha, s) q_3 e^{-q_3 z} \\ & - \alpha^2 \left[\sum_{i=1}^2 A_i(\alpha, s) e^{-q_i z} - \frac{(1 + \tau_0 s) Q_0 \pi \tau (1 + e^{-s\tau})}{q_1^2 q_2^2 (s^2 \tau^2 + \pi^2)} \right] \end{aligned} \right\} \quad (50)$$

On applying inverse Hankel transform to equation (50), one obtains,

$$\bar{u} = \int_0^\infty \left\{ \begin{aligned} & B(\alpha, s) q_3 e^{-q_3 z} \\ & - \alpha^2 \left[\sum_{i=1}^2 A_i(\alpha, s) e^{-q_i z} - \frac{(1 + \tau_0 s) Q_0 \pi \tau (1 + e^{-s\tau})}{q_1^2 q_2^2 (s^2 \tau^2 + \pi^2)} \right] \end{aligned} \right\} J_1(\alpha r) d\alpha \quad (51)$$

On using equations (43), (47), (49) and (51) in equations (25) and (26), we obtain the stress components as,

$$\begin{aligned} \bar{\sigma}_{zz} &= \int_0^\infty \left\{ \begin{aligned} & -2B(\alpha, s) q_3 e^{-q_3 z} \\ & + (\alpha^2 + q_3^2) \left[\sum_{i=1}^2 A_i(\alpha, s) e^{-q_i z} - \frac{(1 + \tau_0 s) Q_0 \pi \tau (1 + e^{-s\tau})}{q_1^2 q_2^2 (s^2 \tau^2 + \pi^2)} \right] \end{aligned} \right\} \alpha J_0(\alpha r) d\alpha \\ \bar{\sigma}_{rz} &= \int_0^\infty \left\{ \begin{aligned} & -(1 + q_3^2) B(\alpha, s) e^{-q_3 z} \\ & + \left[\sum_{i=1}^2 A_i(\alpha, s) q_i (1 + \alpha^2) e^{-q_i z} \right] \end{aligned} \right\} J_1(\alpha r) d\alpha \end{aligned} \quad (53)$$

After applying the Hankel transform to equations (27) and (28), the boundary conditions take the form,

$$\bar{\theta}^*(\alpha, 0, s) = \bar{f}^*(\alpha, s) \quad (54)$$

$$\bar{\sigma}_{zz}^*(\alpha, 0, s) = \bar{\sigma}_{rz}^*(\alpha, 0, s) = 0 \quad (55)$$

On applying the boundary conditions (54) and (55) to equations (43), (52) and (53), the system of linear equations involving unknown parameters $A_1(\alpha, s), A_2(\alpha, s)$ and $B(\alpha, s)$ are obtained as follows,

$$\begin{aligned} & \sum_{i=1}^n A_i(\alpha, s) (k_i^2 - s^2) \\ & + \frac{(1 + \tau_0 s) q^2}{q_1^2 q_2^2} \frac{Q_0 \pi \tau (1 + e^{-s\tau})}{(s^2 \tau^2 + \pi^2)} = \bar{f}^*(\alpha, s) \end{aligned} \quad (56)$$

$$-2B(\alpha, s)q_3 + (\alpha^2 + q_3^2) \left[\sum_{i=1}^2 A_i(\alpha, s) - \frac{(1 + \tau_0 s) Q_0 \pi r (1 + e^{-s\tau})}{q_1^2 q_2^2 (s^2 \tau^2 + \pi^2)} \right] = 0 \quad (57)$$

$$-(1 + q_3^2) B(\alpha, s) + \left[\sum_{i=1}^2 A_i(\alpha, s) q_i (1 + \alpha^2) \right] = 0 \quad (58)$$

On solving the system of linear equations (56) - (58) unknown parameters are determined and the complete solution of the problem is obtained in the Laplace transform domain.

IV. INVERSION OF DOUBLE TRANSFORMS

Due to the complexities involved in the inversion of the Laplace transforms, we employ a numerical scheme based on Gaver-Stehfast algorithm. Gaver [16] and Stehfast [17, 18] derived the formula given below. By this method the inverse $f(t)$ of the Laplace transform $\bar{f}(s)$ is approximated by,

$$f(t) = \frac{\ln 2}{t} \sum_{j=1}^K D(j, K) F\left(j \frac{\ln 2}{t}\right) \quad (59)$$

With

$$D(j, K) = (-1)^{j+M} \sum_{n=m}^{\min(j, M)} \frac{n^M (2n)!}{(M-n)! n! (n-1)! (j-n)! (2n-j)!} \quad (60)$$

where K is an even integer, whose value depends on the word length of the computer used. $M = K/2$ and m is the integer part of the $(j+1)/2$. The optimal value of K was chosen as described in Gaver-Stehfast algorithm, for the fast convergence of results with the desired accuracy. The Romberg numerical integration technique [19] with variable step size was used to evaluate the integrals involved. All the programs were made in mathematical software Matlab.

V. NUMERICAL CALCULATIONS

$$f(r, t) = \theta_0 H(a-r) H(t) \quad (61)$$

where θ_0 is a constant temperature, $H(\cdot)$ is a Heaviside unit step function.

On applying Hankel and Laplace transform to equation (61), we get,

$$\bar{f}^*(\alpha, s) = \frac{a \theta_0 J_1(\alpha a)}{\alpha s} \quad (62)$$

For the purpose of illustration, a mathematical model is prepared for a Copper material with the following material properties,

$$k = 386 J.K^{-1}.m^{-1}.s^{-1}, \alpha_t = 1.78 \times 10^{-5} K^{-1}, C_E = 383.1 J.Kg^{-1}.K^{-1}, \mu = 3.86 \times 10^{10} N.m^{-2}, \lambda = 7.76 \times 10^{10} N.m^{-2}, \rho = 8954 kg.m^{-3}, \tau_0 = 0.02s, T_0 = 293 K, \varepsilon = 0.0168 N.m.J^{-1}, c_1 = 4.158 \times 10^3 m.s^{-1}, \eta = 8886.73 s.m^{-2}, \beta^2 = 4, a = 1, \theta_0 = 1, b = 1.$$

The numerical values for temperature θ and the axial stress component σ_{zz} have been calculated for different time instants $t = 0.1, 0.4, 1$, along the radial direction and are displayed graphically for Lord-Shulman theory (L-S theory) and the particular case of Classical Coupled thermoelasticity (CT theory) as shown in figure 1-2 respectively .

Figure 1 depicts the non-dimensional temperature distribution along the radial direction at different time instants. The variation in values observed for the two theories (CT and LS) in the plots. Due to the application of the heat source, it is observed that the values of non-dimensional temperature θ drops gradually along the radial direction till $r = 5.2$ and then it increases till $r = 7$.

Figure 2 describes the axial stress σ_{zz} along the radial at different time instants. Different profiles of axial stress are seen at small times (i.e. at $t = 0.1, 0.4$) and large times (i.e. at $t = 1$). The difference in results for LS and CT is observed.

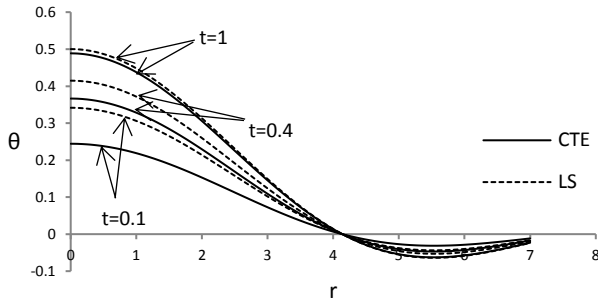


Figure 1. Distribution of dimensionless temperature along radial direction.

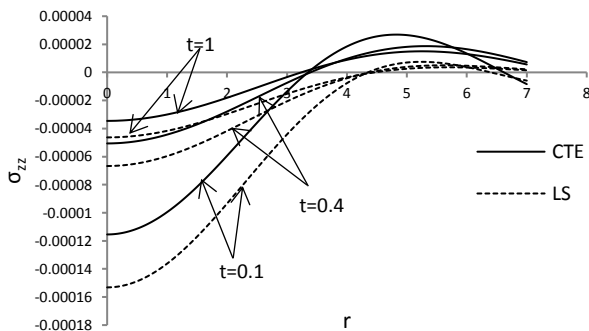


Figure 2. Distribution of dimensionless axial stress along radial direction.

VI. CONCLUSION

A problem in non-classical thermoelasticity (LS model) is formulated for half space with a heat source and the results are compared for the model with CT. It is observed that the non-dimensional temperature and axial stress component along the radial direction predicts changes for small and large times. This type of behaviour of the variables is observed due to the presence of the periodically varying heat source distributed over the radial direction. Due to the presence of relaxation parameter in the field equations, the heat wave assumes finite speed of propagation. Finally, it is concluded that the solutions in this problem will prove to be useful to determine the thermal behaviour in important engineering problems by using the more realistic non-classical model of thermoelasticity.

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Appendix:

Nomeclature:

r	Radius
t	Time
T	Temperature
T_0	Reference temperature
θ	Temperature change
$Q(r, z, t)$	Heat source
k	Thermal conductivity of material
η	Dimensionless characteristic length
c_1	Speed of propagation of the longitudinal wave
u	Radial displacement component
w	Axial displacement component
$\sigma_{rr}, \sigma_{zz}, \sigma_{rz}, \sigma_{\phi\phi}$	Components of stress function
E	Young’s modulus
ρ	Density
C_E	Specific heat at constant strain
μ, λ	Lamé’s constants
L	Laplace transform
δ	Dirac delta function
(r, ϕ, z)	Cylindrical polar coordinates
τ_0	Relaxation times
e	Cubical dilatation
$H(\cdot)$	Heaviside unit step function

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अधिकारपासून वंचित करणाऱ्या मनुस्मृतीसारखे ग्रंथ जाळले.

धर्माचा प्रभाव :

बुध्द, फुले, आंबेडकरी विचारांतून महिलांचे सशक्तीकरण झाले असले तरी आज ही बहुतांश महिला ह्या रूढी, परंपरामध्ये जकडलेल्या आहेत. कर्मकांडात्मक धर्माचा प्रभाव महिलांवर अजुनही आहे त्यामुळे महिलांचा विकास पाहिजे तसा अजुनही झालेला दिसून येत नाही, वैज्ञानिक दृष्टीने विचार आज ही केल्या जात नाही, आणि त्यामुळेच अंधश्रद्धात्मक आचार आज ही घडून येत आहेत. म्हणून महिलांनी आपली स्वताची मानसिकता बदलविणे अत्यंत आवश्यक आहे. किडलेल्या मानासिकतेतून निर्माण झालेले अज्ञान व त्यातून स्त्री मनावर झालेला अंधश्रद्धेचा प्रभाव व त्यामुळे उदयास आलेल्या अनेक समस्या यासाठी व्यवस्था जेवढी जबाबदार आहे तेवढ्याच महिला सुध्दा आहेत असे मला वाटते, कारण महिलांची संख्या पुरुषांच्या तुलनेत सारखीच आहे. त्यामुळे स्त्रियांना अहितकारक जे-जे तत्वे आहेत त्या-त्या तत्वविरोधात आवाज स्त्रियांनी उठवायला पाहिजे. प्रागतिक विचारसरणीचे पुरुष सुध्दा त्यांच्या सोबत आहेत. परंतु तरी सुध्दा असे होतांना दिसून येत नाही महिलांना असमान नीच मानणे, तिला चूल व मूल पुरतेच मर्यादित ठेवणे, तिला वस्तु समजणे, संतती न झाल्यास स्त्रीलाच दोषी समजणे इत्यादी सर्व बाबी पुरुषी अहंकारातून निर्माण झाल्या आहेत. महिलांच्या सशक्तीकरण करिता आज ही ह्या सर्व अडचनी आहेत. म्हणून स्त्रियांनी सदसदविवेक बुध्दीने विचार करण्याची आवश्यकता आहे. कारण महिला सुसंस्कारीत असल्यास ती संपुर्ण कुटुंब सुसंस्कारीत करू शकते आणि अशा सुसंस्कारीत मनातूनच समाज घडत असतो.

स्त्रीवर पुढील पिढी सुसंस्कारीत करण्याची फार मोठी जबाबदारी आहे. लहान मुलांवर स्त्री ही ज्याप्रमाणे संस्कार करील तसे ते मुल घडत असते म्हणूनच तिच्या बाबतीत म्हटल्या जाते की 'जिच्या हाती पाळण्याची दोरी ती जगाचा उध्दार करी', परंतु या स्त्रिलाच बंधनात बांधून ठेवल्या गेले. बाबासाहेबांच्या संविधानाने ही बंधने थोडी सैल झालेली आहेत एकदा का स्त्रीने कुण्या पुरुषाच्या नावाने मंगळसुत्र घातले तर ती त्या मंगळसुत्र घालणाऱ्याची सेविका बनते. तिने कोणासोबत बोलावे, कोणासोबत बोलू नये, नोकरी करावी की करू नये, कसे राहावे, कसे वागणे? या सर्व बंधनांनी ती आज ही बांधल्या गेली आहे. याचाच अर्थ असा की रूढी, परंपराच्या प्रभावापासून आजही त्या पूर्णपणे मुक्त झाल्या नाहीत असे अनेक उदाहरणावरून जाणवते.

वर्तमान स्थिती :

संविधानाने जरी स्त्री-पुरुष समानता दिली असली तरी सुध्दा समाजात अशी उदाहरणे दिसून येतात की, स्त्रियांना त्यांच्या मनाप्रमाणे वागण्यास प्रतिबंध घातल्या जात आहे. मुलांकडे बघण्याचा दृष्टिकोण आणि मुलींकडे बघण्याचा दृष्टिकोण आज ही वेगवेगळा आहे. मुलीच्या जातीने असे करू नये असे सातत्याने तिला सांगितल्या जाते. तंग कपडे घालून कॉलेजला जाते, मित्रां सोबत गप्पा मारते या कारणांवरून तिला टोकल्या जाते आपल्या सख्ख्या बहिणीला ठार मारल्याची २०१५ मध्ये घटना कोल्हपूरत घडली होती. या

घटनेच्या अनुशंगाने कोल्हपूरतील तरुण-तरुणीच्या व नागरिकांच्या ज्या प्रतिक्रिया दुरचित्र चाहिनीवरून प्रसिध्द झाल्या होत्या त्यामध्ये बहुतांश तरुण तरुणी व नागरिकांनी मृतक तरुणीलाच यासाठी दोषी ठराविले होते. त्या मुलीने आपल्या भावाचे ऐकायला पाहिजे होते, मुलींना आपल्या घराच्याचे न ऐकता फॅशन करणे अयोग्य आहे, अशा प्रकारच्या प्रतिक्रिया त्यांच्याकडून ऐकायला मिळत होत्या या घटनेवरून असे दिसून येते की, आज ही महिलांना संविधानाने दिलेल्या अधिकारांचा उपयोग करता येत नाही. समाजाची मानसिकता जोपर्यंत बदलत नाही. तोपर्यंत महिलांच्या स्थितीत विशेष फरक पडेल असे वाटत नाही. म्हणून संकुचित विचारसरणीतून समाजाने बाहेर पडणे आवश्यक आहे.

आज मुली शिकून-सवरून पदवीधर होत आहेत परंतु केवळ पदव्या घेऊन काम भागणार नाही, शिक्षणाचा अर्थ केवळ नोकरीसाठी ज्ञानार्जन असा नाही. शिक्षणाचा उपयोग समाजाचे प्रबोधन करण्यासाठी व्हावा. 'पे बँक टू सोसायटी' साठी महिलांनी घराबाहेर पडणे आवश्यक आहे. समाजामध्ये चांगला बदल घडवून आणणाऱ्या मुलींना घडविण्याची जबाबदारी विविध क्षेत्रात काम करणाऱ्या महिलांनाच घ्यायची आहे. बाबासाहेबांना स्त्रियांकडून खूप अपेक्षा होत्या म्हणून ते नेहमी स्त्रियांनी कसे वागले पाहिजे याविषयी ते सांगत. कुटूंब नियोजनाचे महत्व स्पष्ट शब्दात बाबासाहेबांनी महिलांना सांगितले होते की, लग्न लहान वयात करू नका तसेच लग्नानंतर जास्त मुले निर्माण करणे हा अपराध आहे, हे लग्न करणाऱ्यांनी लक्षात ठेवावे. मुलाबाळांना चांगल्या स्थितीत ठेवण्याची जबाबदारी माता-पित्यांची आहे. लग्न करणाऱ्या प्रत्येक मुलीने आपल्या पतीच्या बाजूने उभे राहिले पाहिजे. त्यांची दासी म्हणून नव्हे तर बरोबरीच्या नात्याने व मित्र म्हणून या उपदेशाप्रमाणे वागलात तर तुम्ही स्वतःचा, समाजाचा अभ्युदय कराल व सन्मान वाढवाल. बाबासाहेबांचे हे विचार आज सुद्धा स्त्री स्वातंत्र्याचा उद्घोष करणारे आहेत. म्हणून महिलांचा खरा उध्दार केवळ बाह्य वेषातील बदलाने, भौतिक संपन्नतेने होणार नाही तर मानसिक विकास घडल्याने, प्रज्ञाबुद्धी जागृत केल्याने होणार आहे.

इलेक्टॉनिक्स मिडीयाची मानसिकता :

आपला समाज सांस्कृतिक मुल्यांपासून दुर जाण्यास बऱ्याच प्रमाणात आजचा इलेक्टॉनिक मिडीया सुद्धा जबाबदार आहे. समाजामध्ये ज्या कुशल मुल्यांचा प्रसार-प्रचार करावयास पाहिजे त्यांचा विचार न करता व्यावसायिक दृष्टीने विचार केला जातो. नैतिक मूल्यांवर व्यक्तिगत स्वार्थ आणि अर्थ सत्ताचे मूल्ये हावी झाले आहेत. अधिक चिंताजनक गोष्ट ही आहे की, आपल्या सिनेमांमध्ये दिवसेंदिवस अधिक सेक्स, त्यावरून हिंसात्मक प्रसंग मोठ्या प्रमाणात दाखविल्या जातात. तरुण-तरुणींच्या अपरिपक्वतेवर याचा विशेष प्रभाव पडतो. सिनेमातील नायक-नायिकांप्रमाणे वास्तविक जीवनात जगण्याची मानसिकता त्यांची बनते. त्यामुळे शिक्षणातून लक्ष विचलित होवून प्रगतीच्या वाटा खूंटविल्या जातात. म्हणून या वयातील तरुण-तरुणींचे प्रबोधन घडवून आणणे चांगली पिढी घडण्याच्या दृष्टीने आवश्यक आहे. या वयातील मुलांसोबत संवाद साधणे आई-वडीलांची

जबाबदारी आहे. आज आई-वडील कुटुंबाचा गाढा चालावा म्हणून आप-आपल्या कामात व्यस्त आहेत. मुलांजवळ बसून त्यांना समजून घेणे त्यांना शक्य नाही किंवा त्याची आवश्यकता त्यांना वाटत नाही. परंतु नवीन पिढिला एक निश्चित दिशा देण्यासाठी आणि समाजात वावरत असतांना काय घ्यायचे? काय सोडायचे? याविषयी मुलांशी संवाद साधता आला पाहिजे. चुकीच्या रस्त्याने चालून लवकर सफलता प्राप्त करण्याचे शॉर्टकट शिकविणारी दृश्ये, साहित्य इत्यादि पासून तरुण-तरुणींना दूर ठेवले पाहिजे.

गुलामी प्रदर्शित करणाऱ्या चिन्हांपासून मुक्ती :

ज्या अर्थी संविधानाने आपल्याला समान अधिकार दिलेले, स्त्री-पुरुष समानता दिली त्याअर्थी आपण आज कुण्या व्यवस्थेचे गुलाम नाही. पुरुषांप्रमाणेच आम्ही सुद्धा प्रत्येक क्षेत्रात कामे करण्यास सक्षम आहोत असा विचार करणाऱ्या महिला सुद्धा आहेत. त्यामुळे त्या कुठल्याच प्रकारच्या बंधनात, चिन्हात अडकवू इच्छित नाही. आज बहुतांश स्त्रिया त्यांच्या वेशभूषेवरून विवाहित आहेत की अविवाहित आहेत हे ओळखता येत नाही, असे पुरुष ओळखता येत नाहीत. आज घुंघट धारण करणाऱ्या स्त्रिया क्वचितच दिसून येतील. आधी जसे विवाहित असल्याचे चिन्हे जसे भांगात कुंक, पायात जोडवे, हातात खुप सान्या हिरव्या बांगड्या इत्यादी सुद्धा लुप्त होत आहेत. केवळ सण-त्यौहारापुरत्याच मर्यादित आहेत जेव्हापासून महिलांमध्ये स्त्री स्वातंत्र्याची चेतना जागृत झाली तेव्हा पासून त्यांच्या मनामध्ये हया सुहाग-चिन्हांच्याप्रति विद्रोहाची भावना निर्माण होऊ लागली. जागरूक महिला आज हया तथाकथित सुहाग चिन्हांचा वापर करण्यापासून परावृत्त होऊ इच्छितात. समाजातील काही घटकांचा विरोध असतांना सुद्धा त्यांनी या चिन्हांचा वापर करण्यापासून आपल्या दैनंदिन जीवनातून नष्ट केला किंवा कमी केला असल्याचे जाणवते. हा सुद्धा समाजामधील महिलांमध्ये घडून येत असलेला फार मोठा बदल आहे.

आंतरजातीय आंतरधर्मीय विवाह :

आधुनिक काळामध्ये स्त्रियांच्या विचारसरणी मध्ये रहनसहन मध्ये आमूलाग्र बदल घडून येत आहे. आज विवाह योग्य मुलींना आपला मनपंसद जोडीदार निवडण्याचे पूर्ण स्वातंत्र्य आहे. पूर्वी मुली करिता मुलगा शोधतांना किंवा मुलीचा विवाह करतांना तिचा त्याविषयी विचार घेण्यात येत नव्हता. आई वडीलांनी, आप्तेष्टा जो मुलगा पसंत केला असेल त्याच्या सोबत तिची इच्छा असो वा नसो तिला विवाह करावा लागत असे आज असे होतांना दिसत नाही. एवेढच नव्हे तर आज वेगवेगळ्या धर्मातील, जातीतील मुला-मुली मध्ये विवाह होऊ लागले आहेत. बहुतांश अशा विवाह मध्ये आज पालक सुद्धा राजी होत आहेत. त्यांची अपेक्षा केवळ हिच असते की, ती चांगला असावा, सुसंस्कारीत असावा असा जर असेल तर आमची काही हरकत नाही. त्यामुळे अशा प्रकरणात पूर्वी सारखे वाद

होतांना दिसत नाहीत. हा सुद्धा एक फार मोठा बदल समाजामध्ये दिसून येत आहे.

समिक्षण :

भारताचा प्राचीन वैदिक-ब्राह्मणी धर्माचा इतिहास हा महिलांच्या पारतंत्र्याचा इतिहास होता. कन्येचा जन्म त्या काळामध्ये स्वागत योग्य नव्हता. मुला-मुलीमध्ये भेदभावाची मानसिकता होती, कारण वंशाचा दिवा किंवा उत्तरदायित्वाच्या प्रयत्नाने समाज बांधलेला होता. परंतु बुध्दकाळात तथागत बुध्दाने वेदांमध्ये प्रदत्त स्त्रीला पशुवत समाजाच्या विचारधारेला धाराशायी करून मातीमध्ये मिळवून टाकले होते आणि स्त्रियांना पुरुषांच्या बरोबर समाजामध्ये दर्जा देऊन महान अशा सामाजिक क्रांतीचा बिगूल वाजविला. तथागतांनी आपल्या संघामध्ये शुद्र, अतिशुद्र, चांडाळ अशा सर्वांना प्रवृज्जा देऊन समानतेचे महान उदाहरण समाजापुढे ठेवले. त्यानंतर आधुनिक काळामध्ये क्रांतीचा ज्योतिबा फुले, डॉ. बाबासाहेब आंबेडकर यांनी स्त्रियांचा सर्वांगण उत्कर्ष व्हावा म्हणून पावले उचलली. डॉ. बाबासाहेब आंबेडकर यांनी त्यानुसार संविधानामध्ये तरतुदी केल्या त्याचाच परिणाम म्हणून आपण स्वतंत्र भारतामध्ये स्त्रियांनी मोठमोठी पदे प्राप्त केली. परंतु दुसरी बाजू विपरीत अशी पहायला मिळते. कारण आजही खेड्या पाड्यातील महिलांची पाहिजे तशी प्रगती झालेली नाही. दलित आदिवासी समाजातील स्त्रियांचा अज्ञानाचा भोळेपणाचा फायदा घेवून त्यांचे शोषण करण्याचे प्रकार आज ही घडतांना दिसून येतात. तसेच उच्च समाजातील स्त्रियांना काही लालच दाखवून, हिरोइन बनाविण्याचे स्वप्न दाखवून तिचे शोषण करण्यात येते. 'मी टू' चे प्रकार हा त्यामधीलच एक भाग आहे. म्हणून समाजामधील प्रत्येकाने नैतिक मूल्ये जोपासल्यास असे प्रकार घडणार नाहीत, याकरिता सुद्धा समाजाचे विद्वत जनांकडून प्रबोधन होणे आवश्यक आहे. जरी आज समाजामध्ये भारतीय महिला हया राष्ट्रपती, प्रधानमंत्री, अधिकारी, डॉक्टर, इंजिनियर, वकील, प्राध्यापक बनल्या तरी सुद्धा अनेक महिलांना आज मदतीची, सहयोगाची विशेष आवश्यकता आहे. महिला सशक्तीकरणाचे हे कार्य विशेष महत्त्वपूर्ण आहे.

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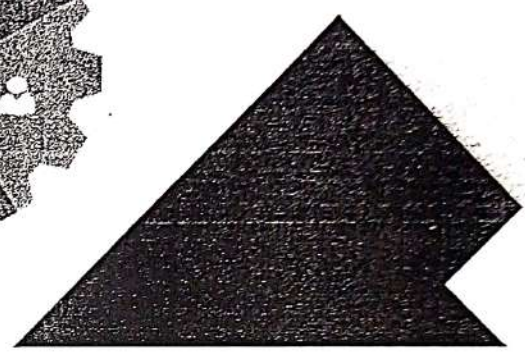
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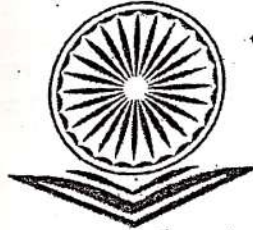
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प्रस्तावना

भारत देशात धर्माच्या नावाखाली जी शोषणाची प्रचंड साखळी निर्माण झाली होती, ती साखळी डॉ. बाबासाहेब आंबेडकरांनी आपल्या अगाध ज्ञान सामर्थ्याने, त्यांच्या दूरदृष्टी युक्त कर्तृत्वाने तोडून टाकली आणि शोषित, पिडीत समाजाला शोषण मुक्त करून त्यांच्यात स्वाभिमान निर्माण केला. डॉ. बाबासाहेब आंबेडकर अस्पृश्य इतिहासातील एक असे पहिले महापुरुष आहेत, ज्यांनी अस्पृश्यातेच्या आजाराचे मूळ कारण शोधले आणि हिंदू धर्माच्या मुलभूत धर्म ग्रंथांना अतिशय ध्यानपूर्वक वाचून त्यांचे गंभीर रूपाने मनन, चिंतन केले. त्यातून ते या निष्कर्षप्रत पोहचले की, अस्पृश्यांच्या गरिबीला, अज्ञानाला, अन्याय - अत्याचाराला, अपमानाला जर कुणी जबाबदार असेल तर ते म्हणजे हिंदू धर्मांमध्ये पवित्र समजले जाणारे त्यांचे धर्मग्रंथ. म्हणून डॉ. बाबासाहेब आंबेडकर या निर्णयापर्यंत पोहचतात की, अस्पृश्य जोपर्यंत हिंदुधर्म आणि त्यांच्या धर्मग्रंथांना मानत राहतील, तोपर्यंत त्यांच्यामाध्ये कुठलीही सुधारणा होऊ शकणार नाही, ते नेहमीसाठी अस्पृश्य म्हणूनच राहतील, कारण या धर्म व्यवस्थेने धर्म शास्त्रांच्या माध्यमातून जनसामान्यांना असे बंदिस्त करून टाकले की, धर्म शास्त्रांच्या विरुद्ध कुणालाच वागता येणार नाही. म्हणूनच डॉ. बाबासाहेब आंबेडकरांनी आपल्या समाजात जागृती निर्माण केली. ही अस्पृश्यता अन्याय आणि शोषण करणार्या धर्मांमध्ये राहून दूर होणार नाही याची त्यांनी समाजमनाला जाणीव करून दिली. शेवटी १३ ऑक्टोबर १९३५ मध्ये येवला मुक्कामी त्यांनी घोषणा केली की, ' हे माझे दुर्भाग्य आहे की, माझा जन्म हिंदू धर्मा मध्ये झाला परंतु आज मी अशी प्रतिज्ञा करतो की, मी हिंदू म्हणून मरणार नाही.' ही प्रतिज्ञा त्यांनी आपली लाखो अनुयायांसह १४ ऑक्टोबर १९५६ ला बौद्ध धम्माची दीक्षा घेऊन पूर्ण केली.

सारांश

डॉ. बाबासाहेब आंबेडकर यांचे जीवन हे अविरत संघर्षाचे जीवन आहे. या त्यांच्या अविरत संघर्षाचे लक्ष होते मानवी समानतेवर आधारित आधुनिक भारताचे निर्माण करणे, एका बौद्ध भारताचे निर्माण करणे. भारतीय समाजामधील सर्व वर्गांमध्ये बौद्ध धम्माचा प्रसार-प्रचार व्हावा ही त्यांची इच्छा होती. म्हणूनच त्यांनी आधुनिक भारतामध्ये बौद्ध धम्माला सर्व सामाजापर्यंत पोहचविण्यासाठी अनेक योजना आपल्या मनामध्ये बनविल्या होत्या. त्यामध्ये -१. बौद्ध धम्माचा एक प्रमाण ग्रंथ असावा २. एक सदाचारी व्यक्ती सुद्धा दुसऱ्या व्यक्तीला बौद्ध धम्मामध्ये दीक्षित करू शकेल यासाठी धम्म दीक्षा विधी तयार केली जावी ३. बौद्ध सेमिनारीची स्थापना ४. प्रत्येक गावामध्ये बौद्ध विहाराचे निर्माण आणि ५. विशुद्ध भिक्खू संघाचे निर्माण. याचप्रमाणे भारतामध्ये बौद्ध धम्माचा प्रसार-प्रचार करण्यासाठी 'भारतीय बौद्ध महासभेची स्थापना सुद्धा केली.

डॉ.बाबासाहेब आंबेडकरांच्या या बौद्ध धम्म स्वीकारामुळेच आज धर्मातरित बौद्धांना एक स्वतंत्र ओळख मिळाली, एक स्वतंत्र संस्कृती मिळाली. भविष्यामध्ये भारताला एका राष्ट्राच्या रूपामध्ये मजबूत करण्यासाठी, येथील लोकशाहीला मजबूत करण्यासाठी, जातिभेदाला नष्ट करण्यासाठी, भारताच्या धर्म निरपेक्ष स्वरूपाला यथास्थितीत ठेवण्यासाठी बौद्ध धम्मापेक्षा श्रेष्ठ दुसरा कोणताच मार्ग नाही. सर्व दलित, शोषित, पिडीत, आदिवाशी इ.चे भविष्य बौद्ध धम्मामध्येच सुरक्षित राहू शकते.

Key words: समानता, बौद्ध धम्म, प्रमाण ग्रंथ, सदाचारी, भिक्खुसंघ.

व्यक्तीच्या जडणघडणीत काही घटना विशेष दिशादर्शक ठरतात. अस्पृश्यातील पहिला म्यट्रिक पास विद्यार्थी म्हणून बाबासाहेबांचा सत्कार करण्यात आला. त्यावेळी त्यांना केळुस्कर गुरुजींनी तथागत बुद्धाचे चरित्र भेट दिले होते. या बुद्धचरित ग्रंथाबद्दल बाबासाहेब एकेठिकाणी म्हणतात- 'लहानपणी माझ्या अभिनन्दनाप्रीत्यर्थ जी सभा घेण्यात आली, तिचे प्रमुख वक्ते दादा केळुस्कर होते. मी सभेत कांय वेडेवाकडे बोललो ते मला आठवत नाही. भाषण संपल्यानंतर केळुस्कर गुरुजींनी तथागत बुद्धाचे छोटेसे चरित्र मला वाचायला दिले. रामायण-महाभारतासारखे बरेच ग्रंथ मी वाचून काढले होते, तसेच हेही पुस्तक मी वाचून काढले परंतु बुद्धाची शिकवण व इतर ग्रंथांची शिकवण यात बरीच तफावत आहे, असे मला आढळून आले. पुढे या पुस्तकासारखी नवनवीन पुस्तके जस-जसा मी वाचू लागलो तस-तसा माझ्या डोळ्यात नवा प्रकाश पडू लागला. बौद्ध धम्म कसा व हिंदू धर्म कसा? या दोघामध्ये किती भेद आहेत, कशी निराळी दृष्टी आहे, हे मला कळू लागले.

यावरून लक्षात येते की, भारतीय विषम समाज व्यवस्थेचा अभ्यास आणि बुद्धाच्या समतामुलक धम्माचा अभ्यास लहान वयातच त्यांनी अभ्यासला होता, त्याचे चिंतनही त्या लहान वयातच केले होते. विषम समाज व्यवस्थेचे अनेक आघात आणि अपमान त्यांनी लहान वयापासूनच निरंतर अनुभविणे होते. परंतु त्या अपमानाने ते डगमगले नाहीत. बुद्धाचा सम्यक विचार त्यांचा आधार बनला होता. त्यामुळे बाबासाहेबांचा दृष्टीकोन अधिक व्यापक आणि दृढ होत गेला.

भारतीय इतिहासातील पहिली प्रतिक्रांती

डॉ.बाबासाहेब आंबेडकरांची अशी मान्यता होती की, वैदिक काळापूर्वी समाज हा जाती-वर्णामध्ये विभागला नव्हता. त्या काळात जन्म, वंश, जातीच्या आधारावर मनुष्याला उच्च-नीच मानल्या जात होते. या समाजाला जन्म, जाती, वर्णामध्ये विभाजित करण्याचे काम वैदिक धर्माने, ब्राह्मणी धर्माने केले आहे. एका जातीच्याप्रती दुसऱ्या जातीच्या मनात घृणा-द्वेष तसेच अपवित्र, अमंगल, अस्पृश्यतेची भावना निर्माण केली. ही वैदिक संस्कृतीची प्रतिक्रांती मानवी शोषणावर, उत्पीडनावर आधारित होती. समाजामध्ये भेद करा आणि राज करा या सिद्धांतावर आधारित होती.

पहिले क्रांतिकारक

वेदांच्या या प्रतिक्रांती विरुद्ध अडीच हजार वर्षापूर्वी तथागत बुद्धांनी विषमतामुलक धर्म व्यवस्थेला नाकारले आणि त्या व्यवस्थेला आव्हान दिले की, "जन्माने कुणीही ब्राह्मण होत नाही किंवा अस्पृश्य होत नाही तर तो त्याच्या कर्मानेच ब्राह्मण

किंवा अस्पृश्य होतो. या एकाच घोषणेने तथागतांनी संपूर्ण वर्ण व्यवस्थेची उतरंड खिळखिळी करून टाकली, म्हणून डॉ.बाबासाहेब आंबेडकरांनी तथागत बुद्धाला भारतीय इतिहासातील पहिले क्रांतिकारक मानले आहे.

तथागत बुद्धाच्या या क्रांती विरुद्ध ब्राह्मणी धर्माने पुन्हा या देशात प्रतीक्रांतीला जन्म दिला आणि त्यांनी आपल्या धर्म तत्त्वज्ञानाच्या माध्यमातून जातीवाद, वर्णवाद, अस्पृश्यता यांना जन्म दिला. ब्राह्मणांची ही व्यवस्था अडीच हजार वर्षांपर्यंत मजबुतीने टिकून राहिली. या जातीवादाच्या, वर्णवादाच्या, अस्पृश्यतेच्या भिंतींना तोडण्याचे काम डॉ.बाबासाहेब आंबेडकरांनी केले.

मानवतावादी बौद्ध धम्माचा स्वीकार

बुद्ध धम्माला परंपरागत धर्म संकल्पनेच्या स्वरूपातच स्वीकारायचे असते तर डॉ.बाबासाहेब आंबेडकरांनी बौद्ध धम्म स्वीकार करण्यासाठी १९३५ पासून १९५६ पर्यंत अशी २१ वर्षे वाट पाहिली नसती, परंतु बाबासाहेबांना परंपरागत बौद्ध धम्मचा स्वीकार करायचा नव्हता. जेव्हा ते एवढ्या वेळपर्यंत या बाबीवर गंभीर रूपाने विचार करू शकतात, तर याचा अर्थच असा आहे की, बौद्ध धम्मच्या संदर्भात त्यांची मान्यता परंपरागत किंवा सनातनी धर्म संकल्पनेपासून एकदम वेगळी आहे. त्यांना या देशामध्ये समानतेवर आधारित समाज व्यवस्थेचे राष्ट्र निर्माण करायचे होते आणि हिंदू सनातनी विषमतेवर आधारित समाज व्यवस्थेच्या विरोधामध्ये विद्रोहासाठी लोकांना तयार करायचे होते, म्हणून ते सर्वात आधी लोकांच्या मनामध्ये, हृदयामध्ये, डोक्यामध्ये क्रांती करू इच्छित होते.

धम्म तत्त्वज्ञान

बुद्ध धम्मचे श्रेष्ठत्व सांगतांना बाबासाहेब सांगतात- 'बुद्धाचे तत्त्वज्ञान हे तर्कावर आधारित बुद्धिप्रामाण्यावादी, मानवतावादी आहे, हिंदू धर्मातील वर्ण व्यवस्थेच्या, जाती व्यवस्थेच्या मुळावर घाव घालणारे आहे. देव, धर्म आणि सर्व शोषण व्यवस्थेला पोषक असलेले कर्मकांड नाकारणारे तत्त्वज्ञान आहे. ईश्वराला मानणार नाही आणि त्यांची पूजा करणार नाही, अशा प्रकारच्या प्रतिज्ञा यामध्ये सांगितलेल्या आहेत. त्याचे कारण हेच आहे की, भारतीय समाजाच्या डोक्यात ईश्वराच्या कल्पनेचे जे भूत शिरलेले आहे, ते निघावे.'

ईश्वर या संकल्पनेला नकार दिल्यानंतर बाबासाहेब धर्म ही संकल्पना सुद्धा नाकारतात. डॉ.बाबासाहेब आंबेडकर यांच्या मते धर्म या शब्दाला निश्चित असा अर्थ नाही, वेगवेगळ्या काळात त्या शब्दाचे अर्थ बदललेले दिसतात, म्हणूनच बाबासाहेबांनी धर्म आणि धम्म यातील फरक स्पष्टपणे दर्शविला आहे. धर्म आणि धम्म या दोहामध्ये कोणतेही साम्य नाही. यामधील फरक दर्शवितांना बाबासाहेबांनी 'बुद्धा एंड हिज धम्मा' या ग्रंथात बरीच दीर्घ चर्चा केली आहे. या दोन्ही बाबी वेगवेगळ्या आहेत. उदा. धर्माचे केंद्रस्थान ईश्वर आहे, इच्छित वस्तू प्राप्त करण्यासाठी तो ईश्वराकडे याचना करतो, तसेच मृत्युनंतर मोक्ष मिळावा, स्वर्ग मिळावा म्हणून मनुष्य नित्यनेमाने पूजा-अर्चा, प्रार्थना, कर्मकांड करित राहतो. याउलट धम्मामध्ये ईश्वराशी काहीही देणे-घेणे नाही. नीती म्हणजेच धम्म आणि धम्म म्हणजेच नीती अशी सांगड धम्म या संकल्पनेत आहे. धम्माला

केंद्रस्थानी मनुष्य आहे,त्याचे नैतिक आचरण आहे,तो चांगले कर्म करून या इहजीवनातच सुगतीला प्राप्त होतो,म्हणून धम्मात नीतीला महत्त्वपूर्ण स्थान आहे.

समाजाची आजची वास्तविक स्थिती

धर्मांतरानंतर आज ६३ वर्षांचा कल लोटला आहे.राहणीमान बदलले,वसतीस्थान बदलले,खाणे-पिणे ही बदलले परंतु बहुतांश लोकांमधील बुरसटलेले विचार बदलले नाहीत.आज जयंत्या,स्मृतिदिन मोठ्याप्रमाणात साजरे होतात परंतु त्यामधील कार्यकर्मांचे स्वरूप वेगळेच असते.विहारे ही संस्कार केंद्रे व्हावीत असे बाबासाहेबांना वाटत होते,परंतु काही अपवादात्मक विहारे सोडलीत तर ती विहारे फक्त जयंती,स्मृतिदिन याच दिवशी उघडतात,बाकी दिवशी बंद राहतात,बऱ्याच विहारांचे व्यवस्थापन विहार एकच पण व्यवस्थापन मंडळे एकापेक्षा जास्त,एक-दुसऱ्याच्या विरोधी प्रवृत्तीचे.त्यामुळे अशा वातावरणामध्ये धम्म प्रसाराचे जे कार्य व्हायला पाहिजे तसे होऊ शकत नाही,परंतु काही वर्षांपासून बुद्ध विहार समन्वय समिती कडून बुद्धविहाराला योग्य दिशा देण्याचे महत्त्वपूर्ण कार्य होत आहे.संपूर्ण विहारांमध्ये समन्वय घडवून आज अनेक विहारांमध्ये प्रबोधनाचे कार्य निरंतर होत आहेत.

बुद्धाचा धम्म हा केवळ विचार धम्म नाही तर तो आचार धम्म सुद्धा आहे.बहुजन समाज हा बुद्ध धम्माकडे तेंव्हाच आकर्षित होईल जेव्हा आपल्या आचरणात त्यांना अतिशय चांगला बदल दिसून येईल.म्हणून आपली प्रत्येक कृती ही धम्मामानुरूप सम्यकच असली पाहिजे.त्यांना आपल्या बोलण्यातून,वागण्यातून धम्म जाणवला पाहिजे.आपल्या प्रत्येक कृतीतून आपल्या मधील निर्मलता,प्रामाणिकता दिसली पाहिजे.इतर धर्मातील लोक हे त्यांच्या पोशाखावरून ओळखायला येतात परंतु बौद्ध माणूस हा त्याच्या वागणुकीवरून ओळखायला यावा.त्याच्याशी संवाद साधतांना लोकांनी ओळखले पाहिजे की, 'हा बौद्धच आहे.'

धम्मदीक्षा देतांना बाबासाहेबांनी आपल्याला बावीस प्रतिज्ञा दिल्या होत्या.या प्रतिज्ञांचे पालन जर आपण केले तर आपण एक चांगली बौद्ध व्यक्ती बनू शकतो.कारण यामध्ये बाबासाहेबांनी आपल्याला आपल्या हितासाठी-सुखासाठी कोणत्या गोष्टी त्यागायच्या आहेत आणि कोणत्या गोष्टीचे आपल्याला पालन करायचे आहे हे स्पष्टपणे सांगितलेले आहे.परंतु असे असतांना सुद्धा त्या बावीस प्रतिज्ञांच्या महत्वाला आपण पाहिजे त्याप्रमाणात समजू शकलो नाही.तसेच डॉ.बाबासाहेब आंबेडकरांनी आपल्या आयुष्याच्या उत्तरार्धात,प्रकृती ठीक नसतांना सुद्धा शास्त्रशुद्ध पद्धतीने धम्माची मांडणी करणारा 'बुद्धा अँड हिज धम्मा'हा ग्रंथ लिहिला.हा ग्रंथ प्रत्येकाच्या घरी असणे अत्यंत आवश्यक आहे.परंतु हा धम्म ग्रंथ सुद्धा बहुतांश लोकांकडे नाही,ज्यांच्याकडे आहे त्यांनी तो वाचलाच असेल याची खात्री नाही.बावीस प्रतिज्ञांचे पालन आणि धम्म ग्रंथांचे वाचन जर आपण केले तर निश्चित रूपाने आपल्यामध्ये सर्वांगिन बदल घडून येऊ शकतो, आपल्यामध्ये ह्या उणीवा असल्यामुळेच आपण कोणत्याच क्षेत्रात संघटीत नाही.धम्म प्रसारासाठी ज्या काही संस्था आहेत,त्यांच्या काही मर्यादा आहेत,त्यांच्या यंत्रणा त्यासाठी अपुर्या पडतात,उपासकांची उदासीनता सुद्धा एक महत्वाचे कारण आहे.

बुद्धिस्ट सेमिनरी स्थापन करण्याची बाबासाहेबांची इच्छा होती.दिल्ली,मद्रास,कलकत्ता,मुंबईसारख्या मोठ्या शहरात 'बुद्धिस्ट सेमिनरी' स्थापन करण्याची त्यांची योजना होती.म्हैसूरच्या महाराजांनी त्यांना याकरिता पाच एकर जागा दिली होती.या सेमिनरीविषयी पीटीआय सोबत बोलतांना त्यांनी सांगितले होते की,ही सेमिनरी दोन वर्षात बांधून तयार होईल.सर्वसामान्य लोकांमध्ये बौद्ध धम्माचा प्रसार करण्याकरिता प्रचारक तयार करणे,हा सेमिनरीचा उद्देश असेल.येथे जात,धर्म,राष्ट्र असा भेद न करता विद्यार्थी घेतले जातील.धम्म शिक्षणाचे एक महान विद्यापीठ कालांतराने याठिकाणी निर्माण होईल.'

अशाप्रकारची योजना बाबासाहेबांची होती परंतु धम्म दीक्षेनंतर पावून दोन महिन्यातच बाबासाहेबांचे महापारीनिर्वाण झाले.त्यामुळे त्यांच्या ह्या योजना पूर्ण होऊ शकल्या नाहीत.तथागत बुद्धांनी ज्याप्रमाणे महापारीनिर्वाणाच्यावेळी म्हटले होते की,'हा धम्मच तुमचा शास्ता आहे,या धाम्माप्रमाणे आचरण करा, कोणताही प्रमाद करू नका.' अशाप्रकारचा संदेश बाबासाहेबांनी आपल्याला दिला की,'तुमचा उद्धार तुम्हालाच करायचा आहे.' याचा अर्थच असा की,धाम्माप्रमाणे आचरण करून स्वताचे कल्याण करा,म्हणून असे म्हणता येईल की,डॉ.बाबासाहेब आंबेडकरांनी आपल्याला कल्याणकारक,मानवतावादी बौद्ध धम्माचा मार्ग सांगितला.त्यानुसार आचरण करून संपूर्ण भारतीयांसमोर एक आदर्श निर्माण केला पाहिजे.असे जर आपण करू शकलो तर बाबासाहेबांचे जे स्वप्न होते की,'भारत बौद्धमय करीन'या त्यांच्या स्वप्नपूर्तीच्या दिशेने आपण वाटचाल करीत आहोत असे आपल्याला म्हणता येईल,हीच त्यांना त्यांच्या अनुयायांकडून खरी आदरांजली ठरू शकेल.

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वर्तमानस्थितीत धम्मविचारांची आवश्यकता

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मनुष्य हा ज्ञानाने संपन्न प्राणी आहे. इतर पशू-प्राणी यांच्यामध्ये भूक-तहान या व्यतिरिक्त दुसरी कोणतीच संवेदना दिसून येत नाही. पारस्परिक हल्ला आणि एक-दसऱ्यांशी हिंसेने जीवन निर्वाहच पशू-प्राण्यांचा धर्म आहे. परंतु मनुष्य जीवनामध्ये चेतना आहे, विवेकबुद्धी आहे. मानवता काय आहे, अमानवता काय आहे? हे तो आपल्या विवेकबुद्धीने ठरवू शकतो. परंतु ही असतांना सुद्धा मनुष्य 'मनुष्या' प्रमाणे जर वागत नसतील तर तो मनुष्य पशू-प्राण्यांमध्येच गणल्या जातो. शरीराने जरी तो मनुष्य असला तरी आचरणाने तो पशुवत असतो. अशा मनुष्यामध्ये हा जो अविवेकपणा, अमानवता दिसून येते, त्याचे मूळ हे धर्मशास्त्रांमध्ये दिसून येते. मनुष्या-मनुष्यामध्ये ऋतूलाच शारीरिक भेद नसतांना त्याच्या जाती-धर्माच्या आधारावर त्याच्याशी पशुवत व्यवहार करणे हे जो धर्म सांगत असेल तर तो 'धर्म' या संकल्पनेत बसूच शकत नाही, ते केवळ बहुजन समाजाचे शोषण करणारे षडयंत्रच आहे. हे षडयंत्र ओळखूनच तथागत बुद्धांनी तत्कालिन व्यवस्थेला आव्हान दिले आणि म्हटले 'जन्माने कुणी वसल होत नाही किंवा ब्राह्मण होत नाही तर तो त्याच्या कर्मानेच वसल होतो, कर्मानेच ब्राह्मण होतो.' उच्च जातीचा अभिमान बाळगणे आणि कनिष्ठ जातीची अवहेलना करणे हे मनुष्याच्या पराभवाचे एक कारण आहे, असे

तथागत बुद्ध समजतात. ते पराभवसुत्तात उल्लेख असल्याप्रमाणे याविषयी म्हणतात- 'जातिथद्धो धनथद्धो, गोतथद्धोच यो नरो। शय्यातिअतिभय्येति, एतं पराभवतोमुखं।।

अर्थात जो मनुष्य जाती, धन आणि गोत्राचे घमंड करतो, आपल्या जातीबांधवांचा सुद्धा जातीमुळे अनादर करतो ते त्याच्या पराभवाचे कारण आहे. या बुद्धवचनाने हे स्पष्ट होते की, तथागत बुद्ध हे तत्कालिन परंपरागत प्रस्थापित सामाजिक, धार्मिक आणि दार्शनिक मान्यतांशी सहमत नव्हते, म्हणून त्यांनी समतामूलक नविन तत्त्वज्ञानाची स्थापना केली.

तथागत बुद्धांची संपूर्ण देसना लोककल्याण आणि शांतीसाठी प्रवर्तित झालेली आहे. त्यांनी आपल्या करुणा आणि प्रज्ञाचक्षुने लोकांना पाहिले की, समस्त प्राणी अज्ञानवश दुःखाला प्राप्त होत आहेत. सम्यकप्रज्ञेच्या अभावाने दुःखापासून मुक्ती शक्य नाही म्हणून तथागतांनी द्वितीय आर्यसत्य दुःख समुदयाच्या रूपामध्ये दुःखांच्या कारणांचा निर्देश केला आहे. या कारणांच्या निर्धाराने दुःखाचा निरोध सांगितला आणि दुःख निरोध पटिपदाची देसना करून मनुष्याला सन्मार्गावर चालण्याचा निर्देश दिला. त्यांनी ज्या मार्गाचे निरूपण केले तो मार्ग प्रज्ञा, शील, समाधी (सम्यक) ची शिकवण देणारा आहे. या मार्गाच्या अनुसरण्यामध्ये लोककल्याणाचे व मंगलमयतेचे आश्वासन

आहे. म्हणूनच त्यांच्या यामार्गाला सुरुवातीला कल्याणकारक, मध्याला आणि शेवटी सुद्धा कल्याणकारक म्हटले आहे. तथागतांचा हा मार्ग सर्वमानवांसाठी आहे. मानवी समाजाच्या उन्नतीचा हा मार्ग आहे. या मार्गामध्ये अंधश्रद्धेला, कर्मकांडाला, इश्वराला, कोण-त्याही प्रकारच्या भेदभावाला किंचितही स्थान नाही.

तथागत बुद्धांनी उपदेशलेल्या धम्मा-प्रमाणे जर मनुष्याने आपले कर्म कुशल ठेवले तर त्याला या इहजीवनातच सुगती प्राप्त होऊ शकते. याकरीता व्यक्तीची दृष्टी सम्यक असली पाहिजे. कारण अविद्येचा विनाश हाच सम्यक दृष्टीचा उद्देश आहे. सम्यक दृष्टीचा हेतू माणसाने कर्मकांडाच्या विधींना व्यर्थ समजणे आणि शास्त्रांच्या पावित्र्यावरील मिथ्याविश्वास टाकून देणे हा आहे. सम्यक दृष्टीकरिता माणसाने अद्भुत कल्पनांचा त्याग केला पाहिजे. ज्या सिद्धांतांना वास्तवतेचा किंवा अनुभवाचा आधार नाही, ते केवळ काल्पनिक अनुमाने आहेत, ते सिद्धांत सम्यक दृष्टीसाठी त्याज्य आहेत.

अंगुत्तर निकायामध्ये म्हटले आहे की, मी आपल्या कर्माचा परिणाम आहो, कर्माचाउत्तराधिकारी आहो.मी जे कुशल-अकुशल कर्म करील त्याप्रमाणे तसतसा त्याचा उत्तराधिकारी बनेल. या प्रकारे हे पूर्णता सत्य आहे की, लोभ, द्वेष आणि मोहामध्ये लिप्त होऊन केल्या गेलेल्या कर्माचा विपाक अनिवार्यच आहे. कोणतेच पापकर्म न करण्याची देशनाच बुद्धाचे शासन आहे. त्याकरिता चित्ताला परिशुद्ध करणे आवश्यक आहे. या मार्गावर चालून व्यक्ती आपल्या संपूर्ण दुःखाचा नाश करतो.

तथागत बुद्धाची धारणा होती की, अज्ञान सर्व प्रकारच्या दुःखाचे कारण आहे.

जर आपण या अज्ञानाला,दुःखाला समाप्त केले तर सर्वत्र शांती प्रस्थापित होईल. हे शांतीमय जीवन दुसरे काही नसून निर्वाणाची प्राप्ती आहे. आज वर्तमानस्थितीत सुद्धा तृष्णाच दुःखाचे मूळ कारण आहे. आज संपूर्ण भौतिक सुख असूनही मनुष्य सुखी नाही तर मानसिक आणि शारीरिक दृष्टीने अशांत असून शांतीच्या शोधांमध्ये तो भटकत आहे. मनुष्याच्या सदगती आणि दुर्गतीचे कारण त्याचे कर्मच असते. हिंसा,चोरी,व्यभिचार हे कर्म त्याज्य आहेत. पंचसीलाचे पालन करणे, आर्यअष्टांगिक मार्गानुसार आचरण करणे हे सत्कर्म आहे.याचा परित्याग करून मनुष्य स्वताचीच जड खोदत असतो. तथागत बुद्धांनी यालाच लक्ष करीत म्हटले आहे की, मनुष्य स्वतःचस्वतःचा मालक आहे, तो स्वतःचा निर्माता आहे.मनुष्य आपल्या जीवनाचे संस्करण आणि परिशोधन स्वतः करतो. याकरिता त्याला प्रज्ञेने युक्त सम्यक दृष्टीचा अवलंब करणे आवश्यक आहे.

मनुष्याच्या आंतरिक मनामध्ये अनेक प्रकारच्या व्याधी असतात. त्याव्याधीपासून मनुष्य आपल्या जीवनामध्ये एवढा जस्त असतो की, जीवनाच्या चांगल्या-वाईटांच्या विषयांमध्ये उचित रूपाने तो विचारच करू शकत नाही. स्वार्थाची भावना त्याच्यावर हावी होऊन जाते आणि माणुसकी नावाच्या शब्दाला त्याच्या जवळ कोणतेच स्थान रहात नाही. ज्याप्रकारे वृक्ष प्राण्यांना जन्म देत नाहीत किंवा प्राणी वृक्षांना जन्म देत नाहीत. कारण या दोन्ही क्रिया प्रकृतीच्या विरुद्ध आहेत. त्याचप्रकारे जिथे राग, लोभ, द्वेष, मोह, माया, मत्सर आहे. तिथे मैत्री कशी राहू शकते? त्याच्या व्यक्तिमत्त्वाचा विकास कसा होऊ शकतो? तथागतांनी मैत्रीविषयी उपदेश देतांना म्हटले आहे की, भिक्खून्तो!जशी पृथ्वी

आघात अनुभव करीत नाही आणि विरोध करीत नाही, ज्याप्रमाणे हवेमध्ये कोणत्याच प्रकारची प्रतिक्रिया राहत नाही, ज्याप्रमाणे नदीचे पाणी अग्नीने प्रभावित होत नाही, अप्रभावित होऊन वाहत राहते, त्याचप्रमाणे हे भिक्खूंना! जर कुणी तुमचा अपमान सुध्दा करीत असेल, तरीसुद्धा तुम्ही आपल्या विरोधकांप्रति मैत्रीची भावना ठेवा. जर तुम्ही मैत्रीचा अभ्यास ठेवाल तर कुणी तुमच्या सोबत कसाही अप्रितीपूर्वक व्यवहार करे तो तुमचे चित्त विचलित होणार नाही. या भावनेने परिपूर्ण संकल्पना मैत्रीच्या आधारावर जीवनाला परिपूर्णता देऊ शकते.

मनुष्य जीवनाची परिपूर्णता, पवित्रता आणि चारित्र्य ही मानवी समाजाची आधारशिला आहे. अज्ञान, क्रोध, हिंसा, कौर्य, व्यभिचार, यामुळे पवित्रतेची जाळे-मुळे नष्ट होऊन जातात. म्हणून सम्यक जीवन जगण्यासाठी तथागतांनी पंचसीलाची शिकवण दिलेली आहे. हिंसा, चोरी, परदारागमन, असत्य आणि मादक पदार्थांचे सेवन करण्यापासून अलिप्त राहणेच पंचसीलाचे पालन करणे होय. सर्व प्राणीमात्रांना दुःख देणारी नित्य व्यवहाराची जी जीवनपद्धती आहे, त्यापासून अलिप्त राहण्यासाठी हे सील याप्रकारची शिकवण देते. पंचसीलाचा स्वीकार करणे म्हणजे निरुपद्रवी जीवनाचा अंगीकार करणे आहे. व्यक्तिमत्त्वाला खऱ्या अर्थाने विकसित करणे आहे.

नीती हा धम्माच्या प्राण आहे. नीतीशिवाय धम्म नाही. मनुष्याने मनुष्यावर प्रेम केलेच पाहिजे हेच धम्माचे अधिष्ठान आहे. धम्मामध्ये नीतीचा संबंध मनुष्याशी आहे. इतराची आज्ञा आहे म्हणून धर्मशास्त्राची आज्ञा आहे म्हणून नीतीमान बना असे धम्म म्हणत नाही. आपल्याहितासाठी मनुष्याने

नीतीमान बनले पाहिजे, हेच धम्म सांगतो. या धम्माचा मुख्य आधार आहे प्रज्ञा आणि सील. प्रज्ञेच्याशिवाय सील आणि सीलाशिवाय प्रज्ञा अधुरी आहे.

चमत्कार, अंधविश्वास, इश्वरवाद इत्यादी मानवी विकासाच्या विरोधी आहेत, यामुळे केवळ अंधश्रद्धेची उत्पत्ती होते, म्हणून तथागत बुद्धांनी या चमत्कारांचे, धर्मान्धतेचे खंडन केले. याबाबत बाबासाहेब म्हणतात— यामध्ये त्यांचे तीन हेतू होते. प्रथम हेतू हा होता मनुष्याला बुद्धिवादी बनविणे. दुसरा हेतू होता मनुष्याला स्वतंत्रतापूर्वक सत्याच्या शोधासाठी सिद्ध करणे आणि तिसरा हेतू होता, जी भ्रामकता मनुष्याची शोध करण्याच्या प्रवृत्तीला मिटवितो त्याच्या उत्पत्तीस्थानालाच नष्ट करणे. यावरून हे स्पष्ट होते की, तथागतांसमोर केवळ मनुष्याचा विकास साधणे हा एकमेव उद्देश होता, ज्याला त्यांनी आपल्या अथक प्रयत्नांनी सिद्ध करून दाखविले.

डॉ. बाबासाहेब आंबेडकर धम्माला मनुष्यमात्राची सेवा करण्यासाठी मानत होते. त्यांच्या मतानुसार धम्म एक असा प्रभाव आहे जो जीवनामध्ये धूळ-मिळून व्यक्तीच्या चारित्र्याचे निर्माण करते. व्यक्तीच्या क्रिया आणि प्रतिक्रिया, पसंत अथवा नापसंतला निश्चित करण्यामध्ये तो सहाय्यक सिद्ध होतो. डॉ. बाबासाहेब आंबेडकरांच्या या परिभाषेला धम्माची सर्वात उत्तम परिभाषा मानल्या जाऊ शकते. या आधारावर जर धम्माला समजले, पारखले आणि ग्रहण केल्या गेले तर निश्चितच मानवतेचे फार कल्याण होईल. परंतु मानव कल्याणाच्या या मार्गामध्ये सर्वात मोठी बाधा धर्मशास्त्रांची आहे. धर्मशास्त्रे मानवाचे कल्याण इश्वरशक्तीमध्येच मानतात. त्यांच्यामते, ईश्वरावर श्रद्धा ठेवली म्हणजे

ज्ञाले, नीतीमान बनले काय किंवा नाही बनले काही फरक पडत नाही. परंतु तथागत बुद्धांच्यामते, मनुष्य ईश्वर प्रार्थनेपासून काहीच साध्य करू शकत नाही. उलट ईश्वर प्रार्थनेमुळे मानवात अज्ञान, अंधकार, अंधश्रद्धा, सम्यक दृष्टीनाश होऊन अंधश्रद्धेत वृद्धी होऊ लागते. काल्पनिक ईश्वरी सत्यापुढे वास्तविक मानवी सत्याला किंमत दिली जात नाही. त्यामुळे मनुष्यामध्ये अंधविश्वास व धर्मआंधळेपणा बळावतो. सम्यक दृष्टी लोप पावल्यामुळे मानव स्वतंत्र बुद्धीने विचार करू शकत नाही. तसेच पापाचरण व दुराचरण वाढीस लागते. म्हणजेच लोकांमध्ये हा गैरसमज निर्माण होतो की, आपण जरी पाप केले तरीपण ईश्वर हा दयाळू असल्याने त्याच्या प्रार्थनेपासून मानवाचे पाप नष्ट होऊन जाते, असा ईश्वरवादी धर्मियांचा विश्वास असतो.

तथागत बुद्धांच्या मतानुसार व्यक्ती किंवा समाजाला नियंत्रित करण्यासाठी अनुशासन त्याला म्हणत नाही की, जे इतर व्यक्तीद्वारे किंवा बाहेरील शक्तीद्वारे थोपविल्या गेले असेल तर अनुशासन त्याला म्हणता येईल की, जे स्वतःच्या सम्यक दृष्टीने स्वमनाने सुव्यवस्थेचे संचालन करीत असेल. 'अत्तदीपभवो' या उपदेशामागे तथागत बुद्धाचा हाच संदेश होता, म्हणूनच बुद्ध धम्म शक्ती, बल किंवा सजा देणे यावर जोर देत नाही, तर व्यक्तीचे आंतरिक मन परिशुद्ध करण्यावर तो अधिक भर देतो. यासाठी सम्राट अशोकाचे एक महत्त्वपूर्ण उदाहरण आपल्यासमोर आहे. तथागतांचा धम्म उपदेशाचा एवढा प्रभाव त्यांच्या मनावर झाला की, त्यांनी संपूर्ण धम्म आचरणात आणला आणि स्वतःची 'लोक कल्याणकारी राजा' म्हणून एक नविन ओळख निर्माण केली, असे

अनेक उदाहरणे आपल्याला बौद्ध साहित्यात पहायला मिळतील की, ज्यांनी तथागत बुद्धांच्या विचारानुसार आचरण केले, त्यांनी समाजामध्ये आपली नवीन ओळख निर्माण केली म्हणून तथागत बुद्धांचे विचार अडीच हजार वर्षांपूर्वीचे आहेत, परंतु आजही त्यांचे महत्त्व तेवढेच आहे. याचाच परिणाम आपल्याला दिसून येत आहे तो म्हणजे आज संपूर्ण जग बुद्धांच्या विचाराला मान्यता देऊ लागले आहे.

समीक्षण

तुलणात्मक दृष्टीने जर अध्ययन केले तर आपल्याला असे दिसून येईल की, इतरत्र अशी धम्मतत्त्वे शोधणे कठिण होईल की, ज्यांची शिकवण लोकांच्या सामाजिक जीवनाच्या एवढ्या सर्व पैलूंना स्पर्श करेल आणि ज्यांचे सिद्धांत एवढे आधुनिक असतील आणि ज्यांचा मुख्य उद्देश मनुष्याला याच धरतीवर, याच जीवनामध्ये विमुक्ती देणारा असेल. तथागत बुद्ध इतरांप्रमाणे मृत्यूनंतरच्या स्वर्ग-नरकाची परिभाषा व्यक्त करीत नाहीत, तर याच इहजीवनातील कर्मानुसार तुमच्या सुगती-दुर्गतीला स्पष्ट करतात. धर्मसंस्था ही सर्वसामान्यांना सन्मार्गावर आणण्यासाठी प्रेरित करणारी असली पाहिजे.

आज तथागत बुद्धांची ओळख केवळ एक धर्मसंस्थापक म्हणून केली जाते किंवा तसा प्रयत्न केला जातो परंतु अशी ओळख पर्याप्त नाही. खऱ्या अर्थाने त्यांची ओळख जगामधला पहिला तत्वज्ञानी, मनोवैज्ञानिक, पहिला वैज्ञानिक मानव अशी आहे. तथागत बुद्धांचे हे दर्शन प्रख्यात वैज्ञानिक अल्बर्ट आईन्स्टाईन पासून तर आजच्या डॉ. अमर्त्य सेनसारख्या नोबेल पुरस्कार विजेते तसेच नविन तत्त्वचिंतकांना झाले, परंतु काय तथागत बुद्धांची खऱ्या अर्थाने ओळख

आपल्या देशाला झाली?, हा प्रश्न आज सुद्धा आपल्या मानसपटलावर निरंतर होतो. आज आपला देश जगामध्ये 'बुद्धाचा देश' म्हणून ओळखला जातो. आपल्या देशाचे प्रधानमंत्री सुद्धा विदेशात गेल्यानंतर मोठ्या अभिमानाने इतर देशवासियांना सांगतात की, 'भारताने जगाला युद्ध नव्हे तर बुद्ध दिला आहे' परंतु ज्यापवित्र भूमीतून तथागत बुद्धांना बुद्धत्व प्राप्त झाले, त्या भूमीवर आजही पंड्या-पुरोहितांचा कब्जा आहे. संपूर्ण जगामध्ये हे एकमेव उदाहरण असले की, एका धर्माच्या पवित्र स्थानी दुसऱ्या धर्माचा कब्जा आहे. कमीत-कमी जगातील लोकलज्जे खातीर तरी सरकारने बुद्धगयेच्या महाबोधी विहाराचा संपूर्ण अधिकार बौद्धांकडे

सोपविला पाहिजे, तरच त्या पवित्र भूमीवरून तथागताच्या कल्याणकारीविचारांचा प्रसार-प्रचार योग्य पद्धतीने होऊ शकेल. कारण आज अतिशय बिकट आणि विषमतामूलक व्यवस्थेमधून देशाला बुद्धाचाविचारच तारू शकतो, याची जाणीव देशाला लवकर होणे गरजेचे आहे.

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संदर्भ

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Effect of Cr³⁺ Doped on Structural, Magnetic and Electrical Properties of Sol-Gel Synthesized SrFe₁₂O₁₉ Hexaferrite Nanoparticles

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Effect of Cr³⁺ Doped on Structural, Magnetic and Electrical Properties of Sol-Gel Synthesized SrFe₁₂O₁₉ Hexaferrite Nanoparticles

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ABSTRACT

Nanocrystalline SrFe_{12-x}Cr_xO₁₉ hexaferrite particles were successfully synthesized via Sol-gel route from Sr³⁺ and Fe³⁺ nitrates at molar ratio of 1:9 (Fe/Sr). The XRD results revealed single hexagonal magnetoplumbite SrFe₁₀Cr₂O₁₉ phase formation in the presence of non-magnetic (α -Fe₂O₃) phases in the heated samples. The dielectric properties as a function of frequency under normal conditions were also measured in the frequency range of 500 Hz to 1 MHz. The variations of dielectric constant are discussed on the basis of Maxwell–Wagner and Koops models. In VSM graph, coercivity and saturation magnetization confirms that the synthesized materials are suitable for applications in magnetic recording media.

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M-type hexagonal ferrites;
XRD; TEM; VSM;
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1. Introduction

The hexagonal ferrites with a magnetoplumbite structure are widely used for technological applications. In particular, strontium hexaferrites are used for their hard magnetic properties. The importance of these materials can be explained by their low price and their reasonable magnetic performances, so the range of applications is extremely wide (electric motors, loudspeaker, toys, etc.) [1]. In early 30s of the previous years, SrFe₁₂O₁₉ was introduced by the researcher. Rapidly, an improved composition containing chromium instead of ferrous has been introduced variation of magnetic properties. More recently, Sr³⁺ and Fe³⁺ were partially substituted by different cations like La–Co [2] or Zr–Zn [3]. In the case of ferrite magnets, high density results in high remanence and sufficient mechanical strength. In order to obtain a high coercivity, a small grain size is needed (about 100 nm) and the narrowest grain size distribution has to be attained.

The conventional method to obtain this material is a Sol-gel microwave induce route. Other processes such as High energy ball milling [4], oxide glass heat treatments [5], gas–solid reactions [6], chemical co-precipitation or hydrothermal process [3] can also be used to synthesis hexaferrites. Compared to the conventional process, the Sol-gel methods allow obtaining materials with smaller particles. In the present work, we report

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on the results of the structural analysis of $\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$ powders prepared by Sol-gel route processing. In particular, we have investigated the influence of the Fe/Cr ratio on the purity and the magnetic properties of the final product.

2. Experimental Procedure

The samples of M-type hexagonal ferrite with formula $\text{SrFe}_{12-x}\text{Cr}_x\text{O}_{19}$ ($x=2$) were synthesized by sol-gel microwave induce route. The synthesis technique involved the combustion of redox mixtures, in which metal nitrates acted as an oxidizing reactant and urea as a fuel. The samples of M-type Sr-hexagonal ferrite were calculated stoichiometrically. The synthesis was performed using strontium, chromium and ferric nitrates, prepared with $\text{Sr}(\text{NO}_3)_2$, $\text{Cr}(\text{NO}_3)_2$ and $\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$. All metallic elements dissolved in deionized distilled water to formation of sol. This solution kept on the hot plate with proper stirred for formation of gel at the temperature of 80°C . The beaker containing the viscous gel was introduced into a microwave oven. The homogeneous solution was placed in a microwave for 5 min. When the solution reached the point of spontaneous combustion, heat is generated in microwave oven.

The entire combustion process, which produces M-type hexagonal ferrite powders in microwave oven. After the completion of combustion reaction, the solid ash was obtained and then it was grounded well in pestle mortar respectively and was used for further characterizations [7–9].

3. Results and Discussion

3.1. XRD

X-ray powder diffraction (XRD) analysis was performed on a D8 Diffractometer (Bruker AXS), using K_α radiations ($\lambda = 0.15406 \text{ nm}$). Diffraction intensity was measured with a 2-theta step of 0.02° . Figure 1, shows the XRD patterns of the $\text{SrFe}_{12-x}\text{Cr}_x\text{O}_{19}$ ($x=0.2$) hexaferrite sample after calcinations at 900°C . The XRD pattern also shows that $\alpha\text{-Fe}_2\text{O}_3$ is still present, SrCO_3 disappeared and $\text{Sr}_4\text{Fe}_6\text{O}_{13}$ appeared which shows dominancy over 14 prominent peaks. The measured ‘a’ and ‘c’ unit cell parameters of the hexaferrites phase are shown in Table 1. Lattice parameter value was found to be $a = 5.92 \text{ \AA}$ and $c = 23.31 \text{ \AA}$ with space group P63/mmc (194). The crystallite size ‘D’ was calculated by using Debye sheerer relation [10]:

$$D = K \lambda / \beta \cos \theta,$$

where λ is the wavelength of X-ray beam, β is the full width at half maxima of prominent peak (FWHM), θ is the corresponding position at particular angle. k is constant and is equal to 0.94, β is the full width at half maxima. The crystallite size was found in the range of 30 nm [11].

3.2. TEM

Transmission electron microscopy (TEM) analysis was performed using a JEOL microscope, operating at 200 kV accelerating voltage and set current on miliampere. Samples

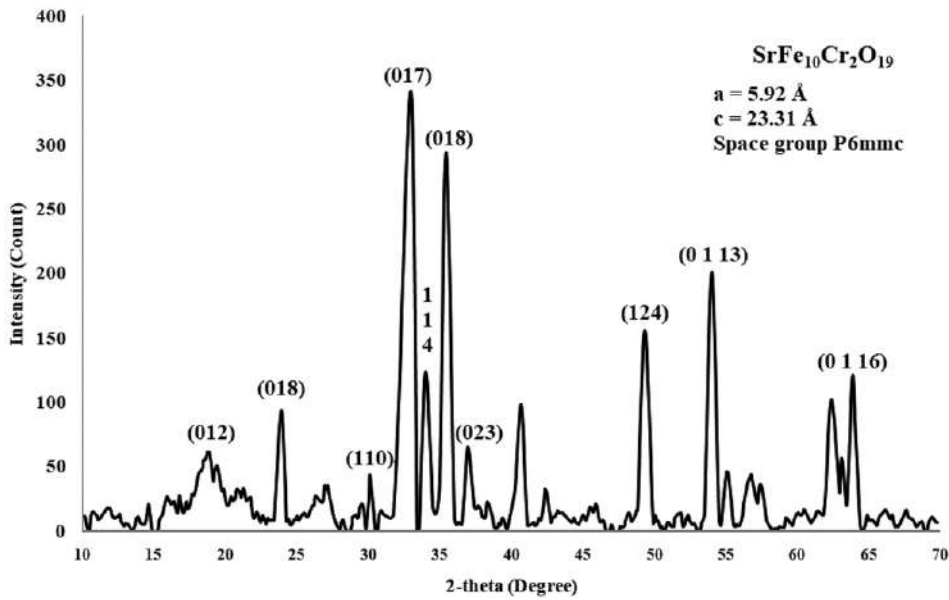


Figure 1. XRD graph of $\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$.

Table 1. Tabular representation of magnetic parameter of $\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$ ferrites.

Composition	a (Å)	c (Å)	c/a	Retentivity Mr emu 10^{-3}	Magnetization Ms (emu/g)	Coercivity Hc (Gauss)	Particle size (nm)
$\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$	5.92	23.31	7.5930	80.91	0.134	3944.5	30

were ultrasonically dispersed in de-ionize water, and then a small drop of the solution was dipped onto a copper grid coated with a carbon film for TEM analysis. In [Figure 2](#) are shown TEM micrographs and selected area electron diffraction pattern (SAED) obtained for hexagonal particles of the $\text{SrFe}_{12-x}\text{Cr}_x\text{O}_{19}$ M-type hexaferrites sample. The average size of the particles as recorded in the TEM images was around 35 to 60 nm for the Sr M-type hexaferrites nanoparticles. The crystallite sizes obtained from the TEM micrographs are found to be in close approximation with the values obtained from the XRD analysis [12].

The SAED pattern show in figure recorded on the whole particle shows more than two diffraction rings indicating that the corresponding particle is constituted of several small crystallites. This observation confirms that the formation of polycrystalline particles of $\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$ and that to obtain a single crystal [13].

3.3. VSM

The hysteresis loops obtained at room temperature for the $\text{SrFe}_{12-x}\text{Cr}_x\text{O}_{19}$ M-type hexaferrites sample, as-prepared and heated at 900°C are displayed in [Figure 3](#). The coercive field (H_c), the saturation magnetization (M_s) are reported in [Table 1](#).

It has to be noted that the M_s values are comparison with some values of bulk M-type hexaferrites obtained from the literature are shows difference. The saturation magnetization (M_s) of the synthesized M-type hexaferrites nanoparticles (at 300 K) from M-

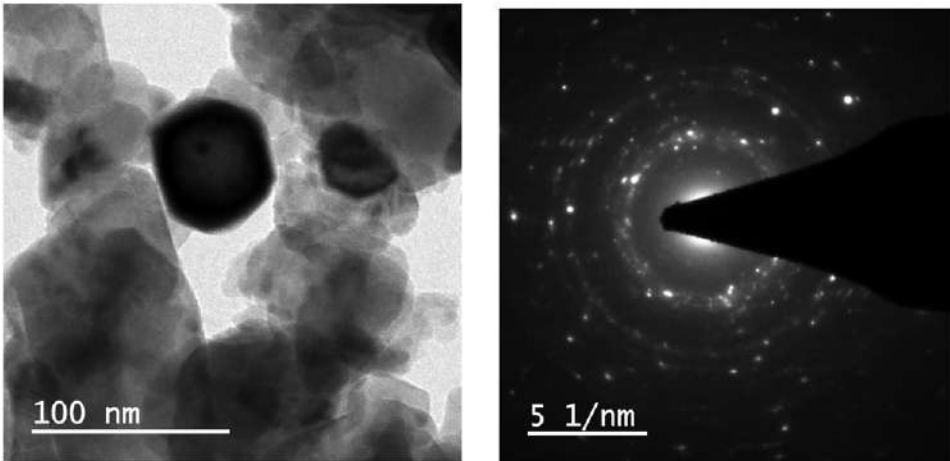


Figure 2. TEM images of $\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$.

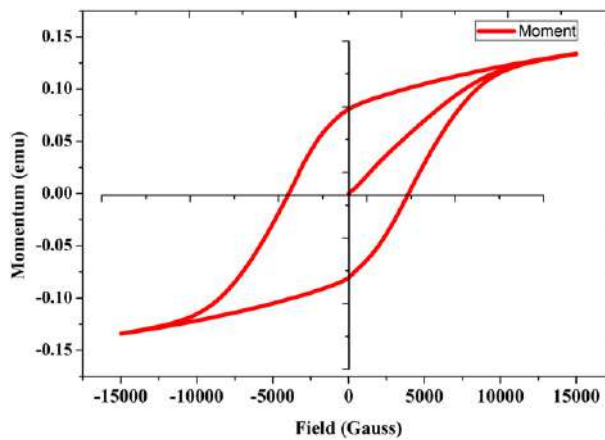


Figure 3. Magnetic hysteresis loop of $\text{SrFe}_{10}\text{Cr}_2\text{O}_{19}$.

H curves for $x = 2$ is 0.134 emu/g and coercivity is 3944.5 Gauss respectively. The values obtained for the Sr M-type hexaferrites at room temperature samples are identical, in agreement with the fact that the nano range samples. Compared to the strontium hexaferrite sample obtained by the hydrothermal process by Ataie et al. [14], our as-prepared sample has higher saturation magnetization (M_s) and lower coercivity (H_c) [15].

3.4. Dielectric Study

In this section, the electrical properties of the synthesized samples are recorded and studied. It is worth mentioning here that the synthesized samples which have improved structural, morphological, magnetic properties also have better electrical properties.

Figure 4 shows the variation of the dielectric constant with frequency for Sr-Cr M-type hexaferrites sample. The dielectric constant initially decreases quickly with increasing frequency for given samples. Similar results were also reported by Nandanwar et al. [16]. The variation of the dielectric constant with frequency reveals the dispersion due to the

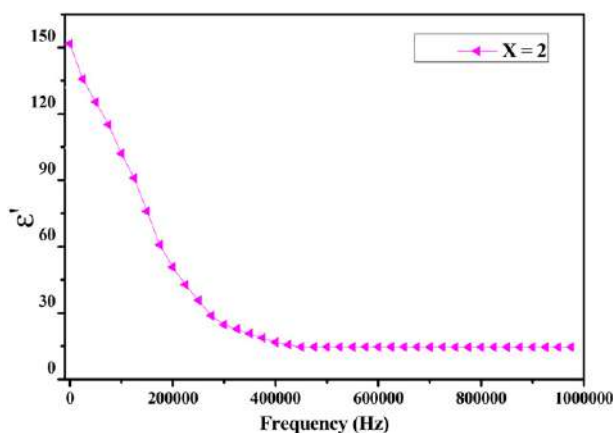


Figure 4. Dielectric variation with frequency.

Maxwell–Wagner type of interfacial polarization in accordance with Koop’s phenomenological theory [17]. The dielectric constant reduces from 150 at 20 Hz to 10 at 1 MHz for given sample. The variation in the value of dielectric constant with increasing frequency is due to fact that the polarization decreases with increasing frequency and then reaches a steady value.

4. Conclusion

The samples of ‘Sr’ M-type hexagonal ferrite with formula were synthesized by sol-gel microwave induce route effectively and successfully. From XRD data we confirmed that the hexagonal phase with space group P63/mmc (194) has been formed. The value of lattice parameter ‘a’ and ‘c’ were found to be enhanced with the substitution of larger ionic radii. Hence here we conclude that ionic radii were strongly affected on lattice parameter. Crystallite size of the sample was calculated using Debye–Scherrer formula and found to be nanometer range of 30 nm and are in good agreement with TEM results.

The saturation magnetization (M_s) decreases with the substitution of nonmagnetic ions. The values of Bohr magneton (μ_B) number decrease with increase in Cr^{2+} concentration this is due to the fact that the saturation magnetization decreases gradually. The variation of dielectric constant (ϵ') with frequency at room temperature shows that the (ϵ') decreases with increasing frequency and tends to reach a constant value.

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Virtual Learning Environment and its Applications to Science Education

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Abstract

The paper highlights the importance of virtual learning environment and advantages of it over conventional methods. It lists different types of Virtual Learning Environment softwares available. It also throws light on e-assessment in Science Education. Virtual learning as regards Higher Education is discussed in the paper. Some information about MOOC courses is also given. Different types teaching tools & technologies are also highlighted in this paper.

Keywords: Virtual learning environment, E-assessment, higher education, teaching tools and technologies.



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Introduction

What is E-learning?

'E-education or e-learning is the transfer of education by electronic teaching methods. This method could be any electronic gadget. CDs, DVDs, television and could also be a means for e-learning. The vibrant use E-learning portals offering online courses globally now are a means for study for many. A lot of people make use of these courses to improvise their learning and career'.

'A Virtual Learning Environment (VLE) is a system for delivering learning materials to students via the web. These systems include assessment, student tracking, and collaboration and communication tools. They can be accessed both on and off-campus, meaning that they can support students' learning outside the lecture hall 24 hours a day, seven days a week. This enables institutions to teach not only traditional full-time students but also those who cannot regularly visit the campus due to geographic or time restrictions, e.g. those on distance learning courses, doing evening classes, or workers studying part-time' [1].

Advantages over conventional method

- A true competition to traditional mode of teaching, e-learning can prove to be a prospective option for many. By taking up an online course, a student in India can take up a course in any foreign university at such a cost. Therefore, it is highly cost-effective for a student. Even for an institution, conducting an online course would mean not having to bear the infrastructural and maintenance costs that come up with any physical building and equipment. Hence, we can say that it is cost-effective for both students and institutions.
- E-learning can be omnipresent. You need not to be physically present and the educators do not need to reach to a place on time to deliver a talk. Students can study from through E-learning. You can also go through it while travelling. In this way, you can be in job and still do e-learning.
- Another advantage of E-learning lies in its flexibility of timing. You can go through a course and then you can access it at leisure as long as you finish the entire course within predetermined time range. Thus, E-learning can be 'on-demand' as well. You can dictate where you want to study and manage the timings also.
- A lot of terms used today to describe e-learning such as e-education, online learning, internet learning. It can be more interactive than conventional form of learning. E-learning has proved a promising method of learning and has a bright future ahead [2].

Different types of Virtual Learning Environment



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There are different types of **Virtual Learning Environment**, but ultimately lead to a common cause. A higher education institution is likely to have a licence for a VLE that fits into any one of the following three categories:

- off-the-shelf, such as **Blackboard**
- open source (often free to use and adapt but support is charged for), such as **Moodle**
- **bespoke** [3].

The most commonly used examples of a VLE include Moodle (link is external) and Blackboard (link is external) [4].

While the idea behind e-learning is to provide education to students who attend traditional classrooms, the appearance of online programs varies so much that it is difficult to formulate actual e-learning.

Virtual learning as regards Higher Education

Higher education is changing and transforming. Massive open online courses (MOOCs) and online degrees enhance the role of Education technology. Universities feel challenged sue to massive digital overhauls.

Flipped classrooms pose a greater challenge to the traditional universities.. Flipped classrooms however, alternate the traditional approach. They also change the mode of learning by delivering online. They free up in-class time and explore study material greatly.

Such digitalized approach makes it possible to greatly enhance the quality of content at low cost. And this is a better factor in changing education.

There are many science universities which have an agenda to educate today's students of the world and aid them with the 21st-century skillsets needed to promote sustainable global development. To improvise, top-quality, tailored digital content and tools alone will not differentiate one university from another. What can be a solution is an optimal combine of such content with a mix of culture, interdisciplinary, research-driven and employability-oriented teaching and methods for used in a hands-on classroom.

On the other hand, education technology is not the main focus of innovation in higher education. It is, however, an essential precondition. To spread out the frontiers of the education sector, institutions must get along *both* elements of innovation – new technologies as well as advances in teaching and learning in a physical classroom – and understand that neither, alone, will be sufficient [5].

E-assessment in Science Education

In summative assessment, which can be termed as 'assessment of learning', boards and related organizations which formulate examinations, especially delivering high-grade exams mostly find this transition from paper-based exam assessment to fully digital assessment an arduous



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one. Practical difficulties such as having the necessary IT hardware set up to allow numerous students to take an electronic examination all at once as well as the need to implement a strict means to undertake such high stake, high level examinations are some of the few challenges that the authorities face in order to implement the electronic nature of examinations. Primary concern among them is the practice of unfair means of examinations practiced. [6].

To assess and effectively communicate the expectations of the science education system to the stakeholders is of utmost importance. Assessment practices often provide operational definitions of what may seem pertinent. For instance, the use of an extended inquiry for an assessment task provides the impetus for what students can learn, how teachers can teach, and where resources can be allocated.

Science teachers are constantly changing the way they believe what good science education is about, and educational policy makers are acknowledging a changing scenario as well.

Importance of data collection and use

Recognition of the importance of evaluation to present day educational reform has catalyzed development, research and implementation of new methods of data collection along with new ways of viewing and accessing data standards. These alterations in measurement practice and theory are often used as repercussions in the assessment standards.

This importance of assessment places greater depths in the results of assessment practices that sample an assortment of variables using different data-collection methods, more than the traditional sampling of one variable in one way. Thus, all features of science education, wherein ability to inquire, scientific understanding of this world, thorough understanding of the nature and utility of science—are usually calculated using multiple methods such as performances and portfolios, as well as conventional paper-and-pencil tests. Figure 1 quantifies data and the need for e-assessment [7].



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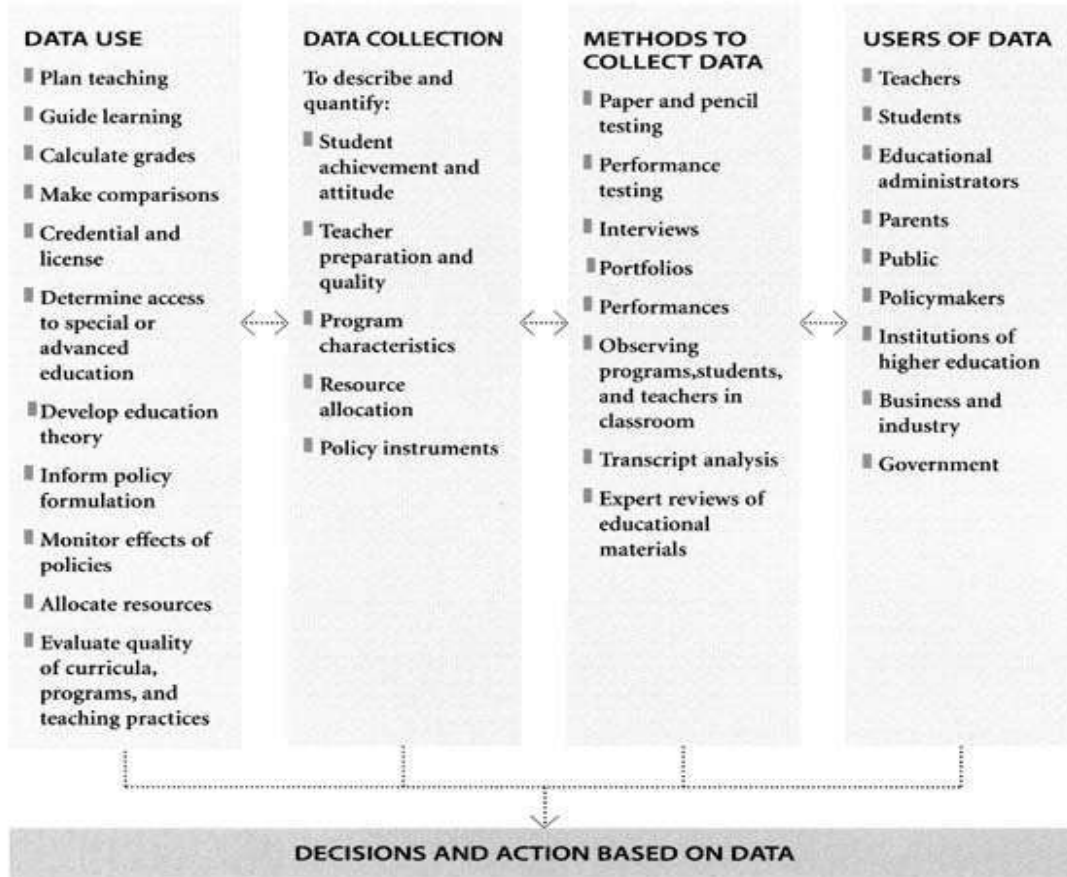


Figure 1

MOOC Courses

The propagation of Massive Open Online Courses (MOOCs) and other forms of online teaching has altered the scenario of learning for students, teachers, educationists and stakeholders in general. Lecturers who were in usual practice of finding a lot of physical students in their classrooms are using the means of e- education to reach out to the students by using web-cams. Checking question papers, finding time to review tests, and giving personalized pointers for these methods of assessments are all diverse quest in e-assessment and online teaching. Companies are using diverse technological tools that make e-learning more assessable, more enjoyable and more pertinent to students, teachers and educationists [8].

Virtual Learning Teaching Tools & Technologies used frequently



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Videos, slideshows, games, and interactive group activities are all part of e-assessment that a teacher can use. When an educationist is tech-savvy as the students; a lot of things can be done in e-classroom. Following are the technological tools available for teachers and students for their use. This can enhance the quality of dialogue between participants who may be away at a longer distance, even at far abroad places [9].

1. Socrative

Socrative is a cloud-based student response system. It lets teachers to test a student by giving mini-quizzes, to be assessed by them laptops or tablets. Quizzes can be of variety type. Socrative's forte lies in its "on the fly" assessment method. It also provides teachers with valuable and timely feedback.

2. Scratch

Scratch is introduction to programming. It is programmed specifically for children upto 16 year old. Children can combine a lot music, graphics, and photos to make games, animations, and slideshows. All of these concepts are in shared mode with all others in a online mode. However, Scratch only teaches programming concepts and doesn't delve into real programming.

3. Prezi

According to Prezi, "creating, giving, and tracking beautiful interactive presentations is as easy as 1,2,3" with their cloud-based presentation software. Prezi presentations are usually not like conventional presentations; zooming in and out and moving side to side across one single, very attractive and modern canvas.,

4. SelfCAD

SelfCAD is a free, cloud-based 3D CAD software package for students. It is user-friendly. However, it provides a unique 3D design experience. Another notable feature— SelfCAD has teamed up with MyMiniFactory, to provide a database of already completed 3D printable designs, making thousands of 3D objects available for immediate 3D printing.

5. Quizlet / Quizlet Live

Quizlet provides an online platform for stakeholders to create and share their own learning materials. That may include diagrams, figures, flashcards and a lot of educational material. Quizlet Live is the free in-class quiz game, produced by Quizlet, that can then bring these learning materials to life



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6. Google Classroom

Google Classroom is a very in and popular social tool for learning. It lets students to post questions and get answers from their teachers and fellow students. It provides an online platform for the students to communicate academically with their teachers. Also, teachers can post complicated questions and lesson materials. It usually is integrated with other Google products such as Google Forms. We can get feedback from students on google forms.

7. Adobe Spark Video

Spark Video is part of the Adobe Spark suite. The application helps students to make short, animated, narrated videos. Students can add photos, video clips, icons, and voice, as well as professional-quality soundtracks and cinematic motion to their video creations with a lot of ease. Video and vlog making is another way to engage students creatively, and an 'out of the box' approach to class projects or reviewing learning materials.

8. Khan Academy

With Khan Academy you can learn anything; all for free. Lessons are presented by way of videos, interactive activities, and challenges. Learners also earn badges in line with their achievements and can save their progress to their own profile.

9. Seesaw

Seesaw is a learning portfolio application, enabling students to document, showcase and reflect on what they are learning at school to learn with ease. Work can be made reachable to parents as well.

10. Class Dojo

A well-behaved student body is associated with better learning for everyone in the class as it minimizes distractions and improves student focus. Class Dojo is a free classroom communication, community building, and behavior management application. Class Dojo enables teachers to not only track behaviour and share this with parents, but also assign students tasks which build positive behavioural skills and traits.

Case study done in college with Google Classrooms



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With the advent of e-learning gathering momentum we also have introduced the concept of google classrooms in our college especially for students opting science. Notes are provided, periodic tests are conducted, assignments are given, concepts are discussed, extra numericals from physics are provided, intimation regarding onset of classes is provided and so many other things are also discussed on google classroom.

Not only that, students refers to google classrooms regularly and provides inputs, feedback, suggestions and also asks a lot of difficulties in this e classroom. A lot of educational presentations related to their syllabus are regularly uploaded in this classroom too.

The benefits are tremendous. All the information is available at finger tips for the students. Also it is easily assessable. The videos pertaining to a particular academic topic help in strengthening the concepts of the students and that too in an interesting way. Various animation and animated concepts on education topics go a way ahead in helping students to get over their syllabus in much deeper and profound way and easily.

Assignments and question paper/answer paper submitted on the google classroom often give a much more methodical way to students to e-assess themselves and more importantly in a paperless way.

Many science concepts can be taught effectively in 3 D mode and giving a more lively environment that makes it attractive to the students to learn without finding it boring and mundane.

The concept of google classrooms is the new age bee and its buzz often attracts students to gravitate towards the concerned topic and concept. They stay abreast with the latest information provided on the google classrooms and tend to use it for knowledge transfer and for the examination they might appear for. It creates a better learning environment and also lets other students give know-how about what is happening on the academic front.

It also makes teaching and learning more enjoyable, deeper and interactive for students, teachers, educationists and ultimately all the stake holders.

Conclusion

The paper gives on overview about virtual learning environment as regards science education by providing the technological edge over conventional teaching methods. A lot of benefits of the e-classrooms are discussed in detail in the paper. Different types virtual leaning environment are discussed. Virtual learning environment as regards to higher education is also discussed. The tools and technologies used in e-learning are discussed in the paper. Also commonly used tools and technology regarding e classrooms are listed in the paper. The paper ends by listing the advantages the author has gained by implementing google classroom in the science classes.



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Innovations in E-learning: The COVID-19 Impact

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Abstract

This paper gives a brief introduction of E-Learning. Then it briefs about the importance of E-Learning. Innovations in E-learning as a result of the impact of COVID-19 are discussed. Some E-Learning platforms used in India are discussed. A rise in alternative source of educational programs is discussed. Though E-learning has its own merits, it had got its demerits too. Some of the flip side of E-Learning is also discussed in the paper.

Keywords: *E-learning, innovations, Covid-19, merits, flip-side*

1.1 E-Learning : Bird's Eye View

E-learning has seen a great rise over the past decade, and it will only continue to improve with new methods and concepts. The E-learning industry has generated new tools to achieve constructive progress and one can choose any of the strategies that suits them best. It is only due to E-learning that the give-and-take of education could be possible in this pandemic situation. Otherwise things could have turned worse with no ways and means to reach out to the student community. So many people are practicing innovative E-learning keeping students preoccupied with teaching, assignments, tests, quizzes, motivational talks, encouragement and in a way infusing positivity in them. So E-learning has paved a positive exercise only through which the students could be in touch with their teachers and mentors and learn something worthwhile.

E-Learning development is tied in with exchanging data rapidly and productively. Students essentially expect you to make it easier for them to discover their needs and ways to achieve them. Innovative E-Learning is always growing in modern education. There has been much research to advance teaching methods and with these methods, you will create an online culture that is very innovative and interesting.

E-Learning is the process of using technology to assist learning and tutoring. Enhancement in how the Internet works, has allowed websites to deliver a visual and immersive learning experience on a computer or mobile device, which is perfect for stimulating a student and encouraging learning [1].

1.2 Benefits of Video Learning

- Video conferencing in real-time enables instructors and students to interact visually. Message boards and chat rooms help construct relationships and make it easier for the students to help one another and enhance accessibility to the instructor.
- These classroom tools and resources are always at the learner's fingertips such that they can also access past lectures, communicate via the message board and interact with their fellow students.

- This ensures that students are least likely to miss or fall behind any lecture, since class information, lectures, and resources are always available online.
- One can function by capturing instructional YouTube videos from learning sites. The viewer also has the facility to pause the video to take notes.

1.3 Some of the recent innovations in E-Learning

- 1) **Smartphone:** Using mobiles for educational purpose is the in-thing now. It has taken the e-learning industry by storm. High prevalence of smartphones makes it necessary for the e-learning industry to introduce mLearning, i.e., mobile learning on a large scale.
- 2) **Massive Open Online Courses (MOOC):** It provides a large number of students with access to study high-quality courses online through video streaming.
- 3) **Gamification in the Learning Process:** Gamification means integrating game mechanics and learning content together to retain and improve skills of a person using it.
- 4) **Learning Management System (LMS):** It is a software application that helps you create educational courses. A lot of universities are implementing this.
- 5) **Interactive Audio-Video Learning:** Streaming videos online is now a regular activity for many people. It is a powerful way to educate and train.
- 6) **Wearable E-Learning Gadgets:** Wearable gadgets such as Google Glass and Apple watch is the new trend that has innovated the e-learning industry. The Google Glass offers features such as Head-Up Display (HUD) which gives users the opportunity to access high-quality content from the comfort of their homes. The use of Virtual reality, Augmented reality and Machine Learning has changed the face of e-learning industry.
- 7) **Automation:** E-learning automation helps to create online content and assessments for a course. It saves time and effort, while also providing a better learning experience for the users.
- 8) **Open Education Resources (OER):** These are documents written by subject matter experts from across the globe on any sector and subject. These resources are available even for the toughest examinations like UPSC, CAT, GMAT, etc.[2]

1.4 E-Learning transforming education in India

1.5

Largely students are affected by school and college closures due to the pandemic. Education, as a result, has majorly moved online. There is a massive surge in the use of language apps, virtual tutoring, video conferencing tools and online learning software in the last few months. India, too, is witnessing an e-learning boom. Conducting classes on Zoom, WhatsApp and Skype is becoming a norm for students and teachers. Here are some of the digital initiatives launched for the students by the Ministry of HRD.

- **SHAGUN Online Junction**

The primary aim of the SHAGUN initiative is to facilitate both teachers and students by offering a platform where they can interact digitally and enhance the learning experience. There are 3 e-learning platforms which come under the purview of SHAGUN-

- 1) **National Repository of Open Educational Resources (NROER):** Students visiting NROER platform will get an exposure to e-libraries, e-books, e-courses, online events and theme based education in both Hindi and English languages.
 - 2) **Diksha:** Requires students and teachers to SCAN the QR code available in the book, in order to access the prescribed learning material.
 - 3) **e-Pathshala:** Through this web-portal, students from class 1st to 12th will be able to access about 1886 audios, 2000 videos, 696 e-books (e-Pubs) and 504 Flip Books.
- **Swayam :** Students can access study materials in the form of Video lectures, reading material, self-assessment tests, online discussions and doubt sessions.
 - **Swayam Prabha :** Swayam Prabha is a collection of 32 DTH channels which run 24x7 for the students. Top education bodies of the nation such as NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS provide content to INFLIBNET.
 - **National Academic Depository (NAD)** run by UGC has tie-ups with approximately 55 school boards, 359 state universities, 123 deemed universities, 47 central universities and 260 private universities.
 - **National Digital Library of India** to provide content to not just school students but also students pursuing higher education and Ph.D. level education.
 - **Virtual Labs** is a consortium of 12 IITs, which aims to operate online classes and study resources through Virtual labs, wherein 700+ virtual experiments are designed and promoted for the aspirants. [3]

1.6 A rise in alternative educational programs

With the ever-increasing advent of Artificial Intelligence and Machine Learning providing an alternative to lecture-based traditional teaching, educational institutions and classrooms may become obsolete. COVID-19 has acted as a catalyst in this case. With schools closed due to the pandemic, many countries have already embraced alternative learning programs.

Many online educational platforms have brought forth free educational tools for students who are stuck at their homes. Some tutoring platforms are also available at their convenience. Thus, they can set a time for the online classes according to their wish. It is way better than the live meetings with teachers [4].

People strongly advocate higher education, utilizing the full power of technology. Technology can enable different teaching methodologies and also provides access to a large

number of people across the country. In a country like India, where we don't have enough teachers or easy access to good institutions, using the power of technology would be very much helpful.

1.7 E-Learning : The Flip Side

- On the flip side, given that the college and university faculties hastily moved courses online without much support, online learning is being poorly managed. Faculty members who have struggled in the online environment and haven't received enough support from their college or university are unlikely to have much enthusiasm for online learning in the future. The digitalization of education can also widen the equality gaps already present in different parts of the world. Only 60% of the world's population is online. That means many students do not have access to digital devices and data plans. They are most likely to lose educational opportunities due to the lack of digital access. Following are some of the crucial impacts of the COVID-19 on the education sector. [5]
- Parents complain of increased screen time of their children, which is now inevitable. There are a few parents who are not comfortable with technology themselves.
- Many a times, the classes get disturbed due to Internet issues. While technology is enabling, it can also be limiting, especially in India where basic internet access is a challenge. Not every student has a computer or fast-streaming internet at home. This leads to issues with attendance and participation in online sessions. Also, some of the students are from remote villages which have slow and patchy internet speeds.
- Exams would need to be conducted at commercial exam centers. Students would need to travel to the nearest center.
- There is pressure on teachers, too. Every teacher has a unique teaching style, which evolves over time. It is easier for them to observe students' body language in the class and their interactions with other fellow mates. This advantage is missing in E-learning.
- Education is not just about classes. It is about interactions, broadening of ideas, free-flowing open discussions, debates and mentoring of each student. In the bid of online classes, a lot gets lost in translation on the online platform. In a discipline like law, where discussions and debates form the backbone.
- Viva, moots, debates, and classroom discussions on polarizing topics require nuanced perspectives — these lose their flavor when done online. Mentoring, debates, and casual conversations are better in traditional classrooms.
- Students ask fewer questions online. The greatest advantage of face-to-face teaching is eye contact, which helps teachers gauge if students are following what is being taught.
- There is an excitement present in a real classroom. It is a real time experience.
- Also, the students studying online, are cut-off from access to the university library.
- The idea that teaching can be dematerialized could lead to the next thought — of using resources produced elsewhere to mass-educate people within public education. These are especially true of STEM subjects (science, technology, engineering, and mathematics), which might reduce universities to examining bodies that have subcontracted intellectual content to MOOCs produced elsewhere.

- Higher education is seldom about exams, classes, or grades. Rather, it is about an experience that prepares a student to become a functioning member of the work force, with requisite knowledge, skills, and life experiences [6].

Conclusion

E-Learning has its merits and demerits too. Presently it is the only source of education as far as India is concerned. Accessibility, ease of teaching and a widespread audience are some of the merits that are discussed in the paper. However, increased screen time, inaccessibility of the internet especially in rural regions, not so real experience and a lack of educational environment are some of the parameters that restricts the E-Learning processes in India.

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Effect of Cobalt and Nickel Substitution on Structural and Magnetic Properties of Spinel Ferrite

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Effect of Cobalt and Nickel Substitution on Structural and Magnetic Properties of Spinel Ferrite

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ABSTRACT

Cobalt substituted Nickel ferrites, $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$ where $x = 0, 0.6$, one were successfully synthesized by sol-gel auto-combustion method. With the help of the XRD machine, the phase formation and structural analysis of the samples have been carried out. The surface morphology has been studied using Transmission Electron Microscopy. The magnetic properties of the synthesized samples were carried out using Vibrating Sample Magnetometer. The lattice parameter was found to be in the range of around 8 \AA it is noted that the lattice parameter is varied sample to sample and have been mentioned in this research paper.

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KEYWORDS

Spinel ferrite; nanostructure; magnetic properties; structural properties

1. Introduction

We all are surrounded by magnetic field and magnetic material so the researchers have taken much more interest in magnetism and magnetic material. In this era of scientific revolution magnetism and magnetic material play a very important role [1]. Since ferrite is an important magnetic material for their individual Industrial and biomedical application, in the present research module we are dealing with a ferrite material, since ferrite is divided by two main categories that are soft ferrite and hard ferrite [2]. The soft ferrite and hard ferrite have there in individual significant and different way of applications due to their different structural and geometrical arrangements of atoms which present in their crystallographic system [3]. the structure of soft ferrite also known to be spinel ferrite possess a cubic crystal structure having general formula MeFe_2O_4 where Me is divalent cation such as Co, Ni, Zn, etc and Fe is a trivalent cation. There are total 56 atoms in the cubic crystal structure of ferrite, out of 56 atoms 32 are the oxygen atoms which act as an anion and eight divalent cations also 16 trivalent cations [4]. In general, divalent cations would occupy in 64 tetrahedral sites (or A site) and trivalent cations such as Fe^{3+} cations occupied at 32 of the octahedral site (or B site). The Co and Ni both are strong magnetic material having magnetic moment of $3\mu_B$ and $2\mu_B$ respectively. Therefore, for site preference of Co and Ni and their molar ratio may change the magnetization of Co-Ni substituted spinel ferrite. From the literature survey, we noticed that the magnetization of

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material based on structural and cationic distribution parameter hence in the present research work we focused on structural dependent magnetic property of the system [5].

2. Experimental

$\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$, where $x = 0, 0.6$, one nanoparticles were synthesized by sol-gel auto combustion technique dealing with urea as a fuel [6]. The stoichiometric proportions of metal nitrate severally dissolved in 10 ml double distilled water and adding 1 mole urea in it. Then the resulting solutions were mixed properly and stirred at room temperature [7]. The mixed solution was taken for heat treatment at 60°C till one-fourth solution is left, up to the mark of formation of a viscous gel, then the gel was kept in a microwave oven for an instant fire at 600 watts. The dried gel started and finally, the powder was obtained. Prepared ferrite powder was grinded for 4 hrs and annealed at 800°C for 4 hrs in a muffle furnace. At last the powdered material is grinded in mortar for another four hours to obtain the final product [8].

3. Characterization of Materials

The single phase recognition of materials were obtained by using X-Ray Diffraction (XRD) using Cu $K\alpha$ - radiation in the range of $10-80^\circ$ of the 2θ . The surface morphology of the powder samples were analyzed by transmission electron microscopy (TEM) and Scanning Electron Microscopy (SEM). The magnetic measurements were made by using vibrating sample magnetometer (VSM) at room temperature

4. Results and Discussions

4.1. Structural Analysis

X-ray diffraction patterns of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$, where $x = 0, 0.6$, one spinel ferrite nanoparticles are shown in Figure 1. The XRD patterns well match all the characteristic reflections of cubic spinel structure without any extra peaks therefore the structure is single phase [9]. The lattice parameter (a) and average crystallite size (D), Bulk density, X-ray density, Porosity of the entire sample were mention in Table 1. The XRD data has characterized through Rietveld refinement method, the XRD refinement was taken continuously until we get the convergence reached with a goodness factor very close to 1. The values of R_{wp} (discrepancy factor) and R_{exp} (expected values), with the goodness of fit (χ^2) have been mention in Table 2, from the survey of literature we found that the goodness values of our Rietveld refined sample have the good agreement with the reported values in previous literature [10]. Figure 1 shows the typical Rietveld refined of X-ray pattern for sample $x = 0, 0.6$, and one respectively. The experimental lattice constant and the calculated lattice constant by the Rietveld method are in good agreement with each other mentioned in Table 2. The lattice constant increases gradually with the substitution of Co^{2+} ion and reached maximum for CoFe_2O_4 sample because the Co^{2+} has the larger ionic radius as compared to Ni^{2+} [11, 12]. The present system of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$ under investigation is either mixed spinel ferrite for $x = 0.6$, one and inverse spinel for $x = 0$ which is understood by Table 3 of cation distribution. X-ray density (d_x) was determine by using formula, d_x

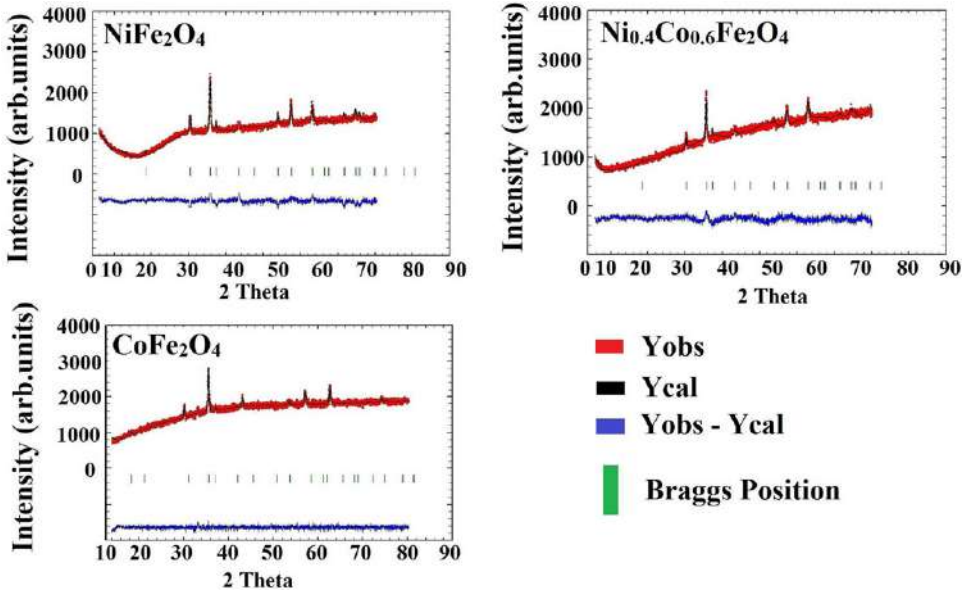


Figure 1. Rietveld refinement of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$.

Table 1. Crystalline size and X- ray density.

Sr. No.	Sample	Crystalline size (nm)	X- ray density	Bulk – density	Porosity (%)
1	NiFe_2O_4	12.60	5.2420	2.9963	42.84
2	$\text{Ni}_{0.4}\text{Co}_{0.6}\text{Fe}_2\text{O}_4$	33.24	5.2780	3.0610	42.00
3	CoFe_2O_4	23.98	5.3092	3.0724	42.13

Table 2. Rietveld refinement data and its goodness.

Sr. No.	Sample	Lattice parameter (Experimental) Å	Lattice parameter by Rietveld Å	Rwp (%)	Rexp (%)	χ^2
1	NiFe_2O_4	8.3300	8.32711	66.3	34.3	3.37
2	$\text{Ni}_{0.4}\text{Co}_{0.6}\text{Fe}_2\text{O}_4$	8.3485	8.3455	78.0	46.26	2.84
3	CoFe_2O_4	8.3717	8.3766	93.7	21.98	12.5

Table 3. Cation distribution and magnetization.

Sr. No	Sample	Cation distribution	Bohr magnetron (μ_B)	Saturation Magnetization (emu/g)
1	CoFe_2O_4	$[\text{Co}_{0.4}\text{Fe}_{0.6}]^A [\text{Co}_{0.6}\text{Fe}_{1.4}]^B \text{O}_4$	4.6	7.8
2	$\text{Ni}_{0.4}\text{Co}_{0.6}\text{Fe}_2\text{O}_4$	$[\text{Co}_{0.3}\text{Fe}_{0.7}]^A [\text{Co}_{0.3}\text{Ni}_{0.4}\text{Fe}_{1.3}]^B \text{O}_4$	3.8	2.41
3	NiFe_2O_4	$[\text{Fe}_{1.0}]^A [\text{Ni}_{1.0}\text{Fe}_{1.0}]^B \text{O}_4$	2	2.07

$= 8M/\text{Na}3$ where M is the molecular weight of sample and N is known for Avogadro's number, also 'a' indicates as lattice parameter, X-ray density increases linearly with Cobalt concentration because Cobalt atom is slightly heavier than the Nickel atom [13, 14].

4.2. Transmission Electron Microscopy

The TEM images of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$ is shown in Figure 2, spherical as well as square shape particles of 40- 70 nm size is clearly visible in the TEM images. From the Figure

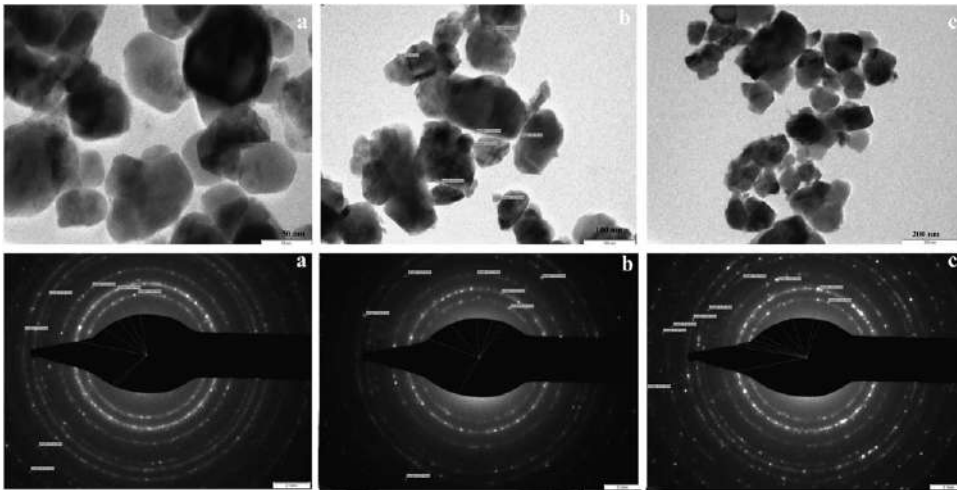


Figure 2. TEM and SAED Pattern of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$.

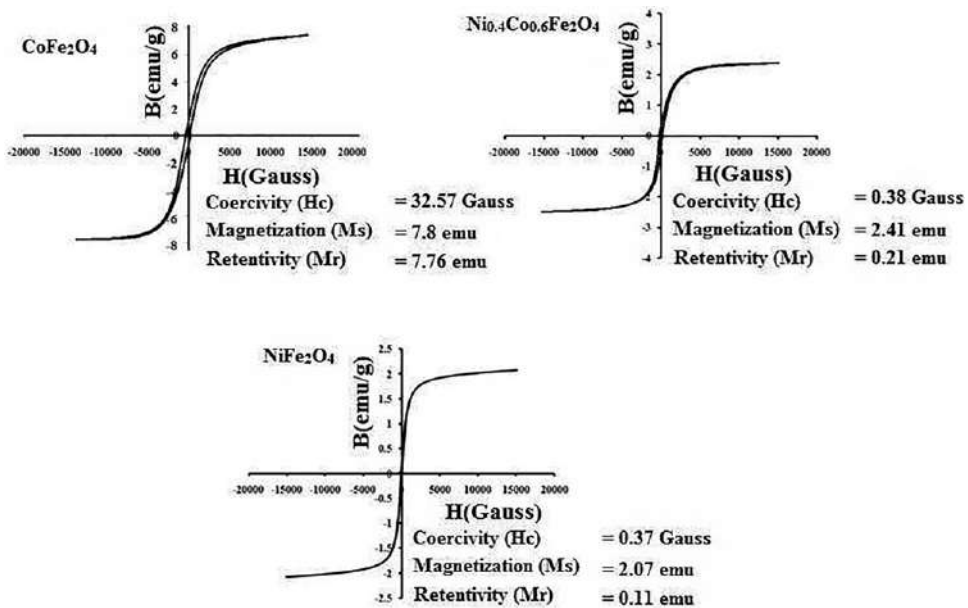


Figure 3. VSM Graph of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$.

2 we also notice that a large numbers of small particles held together by interfacial forces which are responsible for agglomerate particles. The appearance of such agglomerates particles has also been reported in the literature [15]. Figure 2 also shows some well separated square shape particles of average size around 40- 50 nm range which support the cubic of present ferrite system. The Selected area electron diffraction pattern (SAED) of the particle suggests the highly crystalline nature of the sample and have good agreement with XRD pattern [16].

4.3. Magnetic Measurements

Magnetic measurements of $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$ sintered spinel type ferrite were recorded at room temperature. A typical hysteresis loop of spinel system has shown in Figure 3. The hysteresis loop for the as obtained sample exhibits very small area of hysteresis loop therefore the material synthesized for the present research module is close resemble to superparamagnetic nature [17, 18]. The saturation magnetization of the samples sintered at 800°C is increasing order with the substitution of Co^{2+} ion, which is in good agreement with the calculated Bohr magneton. The values of Bohr magneton calculated from X-ray diffraction cation distribution is well accord with saturation magnetization and have reported in Table 3. The reduction of saturation magnetization with the reducing cobalt concentration can be acknowledged by the fact that due to relatively high orbital contribution to magnetic moment of Co^{2+} ions are known to give large induced anisotropy. A decrease in coercivity with an increase in nickel concentration may be assigned to the decrease in anisotropy field, which in turn decreases the domain wall energy [19, 20].

5. Conclusion

The nano-size $\text{Ni}_{1-x}\text{Co}_x\text{Fe}_2\text{O}_4$, where $x = 0, 0.6$, one spinel ferrite have been successfully synthesized by the sol-gel auto-combustion method and examined through XRD VSM and TEM. From the above characterization, we conclude that the Co^{2+} and Ni^{2+} ions substitution in the spinel ferrite system plays an important role in the context of structural and magnetic properties. With the help of x-ray diffraction technique, we concluded the formation of a single crystal structure which is good agreement with the crystalline nature confirmed by SAED pattern of TEM images. The saturation magnetization of the materials is well matched with the total magnetic moment of individual material. we noticed that the Co^{2+} doped spinel ferrite have the largest lattice constant and highest magnetization value whereas the Ni^{2+} substituted spinel ferrite have the lowest lattice constant and smallest magnetization values. Therefore we concluded that the structural and magnetic properties of present spinel system well depended on the substitution of cobalt and nickel.

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Study of structural and magnetic properties of Zinc-Substituted Cadmium ferrite nanocrystals

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ABSTRACT

Polycrystalline $Cd_xZn_{1-x}Fe_2O_4$ ferrites with ($x = 0.2$ and 0.8) have been prepared by conventional microwave induce sol-gel method. The Calcination of samples was performed at $800\text{ }^\circ\text{C}$ for 4 h. The prepared powder samples were structural and compositional characterized by XRD and FE-SEM. Rietveld refined XRD patterns exposed the cubic spinel phase. The magnetic property of prepared samples was investigated using VSM. Magnetization measurements have shown that the particles have superparamagnetic behavior at room temperature. The hysteresis curves of the sample exhibited the reduction of saturation magnetization and coercivity by Zn^{2+} ions substitution.

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1. Introduction

The ferrites are new class of materials to reduce themagnetic and electric losses over conventional magnetic materials. The technical importance of ferrites lies in there, high saturation magnetization, low coercivity, high permeability, high electrical resistivity, and low loss factor.

A large importance of Spinel ferrites among ferrites category for commercial applications is observed because of their outstanding electrical, optical and magnetic properties [1]. Zinc as well Cadmium ferrite belongs to the category of normal spinals structure [2]. In the spinel structure the oxygen ions are closely packed into fcc lattice having two kinds of interstitial spaces for the metal ions which are named as tetrahedral (A) site and octahedral (B) site [4]. Basing on the favorable occupancy of metal ions in these sites, the spinel ferrites are grouped as normal and inverse spinel structure. In normal spinel the divalent metal ion (M^{2+}) completely occupies tetrahedral (A) site and trivalent iron ions are completely occupy octahedral (B) site, whereas in inverse spinel the divalent metal ion (M^{2+}) completely occupies octahedral (B) site and trivalent iron

ions (Fe^{3+}) are equally distributed between the tetrahedral (A) and octahedral (B) sites [4]. According to studied by S.V. Bhandare et al. (2020) [3], (Zn^{2+}) diatomic ions prefer to occupied tetrahedral site and (Fe^{3+}) ions occupied octahedral site and finally form normal spinel. Since the last four decades, structural and magnetic properties of Zinc and Cadmium individually have been studied by the physicist.

In recent years, synthesis of MFe_2O_4 (M = Divalent metallic ions) nanoparticles of desired size and magnetic properties has become the topic of investigation of many researchers. Different synthetic techniques such as coprecipitation [4], microemulsion [5], ultrasound irradiation [6] etc. have been developed for synthesis particles smaller than 20 nm. These methods can control the particle size and shape, which are important parameters in the chemical and physical properties of nanoparticles.

In the current research work, we have focused on the synthesis of Zn doped Cd ferrite nanoparticles by employing Sol-gel auto combustion technique. In order to confirm the structure, type of magnetic ordering and to study the effect of the magnetic behavior of Cd-Zn spinel ferrites nanostructure, we have carried out Rietveld analysis of XRD, Scanning Electron Microscopy (SEM), quantitative analysis by EDX and magnetization studies by Vibrational Sample Magnetometer (VSM) on series of Cd-Zn nanostructured powders.

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Table 1
Tabular representation of XRD parameters.

$Cd_{1-x}Zn_xFe_2O_4$	Lattice Parametera (Å)	Volume a^3 (m^3)	Bulk Density (g/cm^3)	X-ray Density (g/cm^3)	Porosity (%)	Particle Size (nm)
$x = 0.2$	8.51	613.8×10^{-30}	3.06	5.41	33.5	19.48
$x = 0.8$	8.67	652.1×10^{-30}	3.36	5.68	28.7	21.42

2. Experimental

2.1. Materials

The requirement of various metallic ions like Nickel nitrate ($Ni(NO_3)_2 \cdot 6H_2O$), Ferric nitrate ($Fe(NO_3)_3 \cdot 9H_2O$), Cadmium nitrate ($Cd(NO_3)_2 \cdot 6H_2O$) and Urea (CH_4N_2O) AR grade were purchased from Loba Chemie PVT. LTD. (India). Without any further purification all the chemicals were used for experiment.

2.2. Characterization techniques

The structural analysis of the synthesized samples was carried out using X-ray diffraction (XRD) technique. X-ray diffraction patterns of all samples recorded at room temperature using X-ray diffractometer (Bruker AXS D8 Advance XRD System, $Cu-K\alpha$ radiation, $\lambda = 1.5406 \text{ \AA}$). The scanning 2θ range was between 20 and 80° (scan step of 0.02°). The IR spectra of all samples were recorded at room temperature in the range of $400\text{--}4000 \text{ cm}^{-1}$ using IR-spectrometer (Thermo Nicolet, Avatar 370). Surface morphology was examined using SEM micrographs and an energy dispersive spectroscopy technique (EDX, SEM- JEOL-JSM 6100) was used for elemental analysis. A vibrating sample magnetometer (Lakeshore VSM 7410) was used to record magnetic hysteresis loops of prepared samples under an applied magnetic field of up to ± 15 kilo Gauss and magnetic parameters were obtained from magnetic hysteresis loops.

2.3. Preparation of Sol-gel method

Cadmium Zinc spinel ferrite was synthesized by the Sol-gel auto combustion method. In given synthesis method, mixing of metal ions in the solution state during the initial stage of preparation to gate homogeneous mixture. For example; Nickel nitrate ($Ni(NO_3)_2 \cdot 6H_2O$), Ferric nitrate ($Fe(NO_3)_3 \cdot 9H_2O$), Cadmium nitrate

($Cd(NO_3)_2 \cdot 6H_2O$), powders were dissolved into 20 ML de-ionized water solution under stirring process. A sol is a colloidal dispersed solid phase. The sol can be stabilised by adjustment of pH, otherwise, the particles will grow to agglomerates. Urea used as a standard fuel with stoichiometric ratio in sol-gel synthesis. These compounds allow through mixing of the species on the atomic scale, to enhance the reaction rate and provide suitable fuel.

The formation of gel is a next step occurs. This is an essential step to remove most of the solvent so that a rigid pest of well define chemistry is formed. An aqueous solution of metallic ions gradually heated at about $80^\circ C$ for 4 h on a hot plate with magnetic stirrer. The gel is highly viscous with maintaining parameters like pH, temperature and time.

The gel is shaped to the required morphology. This may be as spheres, fibers or coatings. The dry ash was obtained after gel fire in the micro-wave oven in 3 min. This ash forming compounds were grounded in a mortar pestle to obtain fine nano size powder. Conventional sieving is performed by calcite fine powder in muffle furnace for 4 h at $800^\circ C$ to obtain a spinel ferrite compound $Cd_xZn_{1-x}Fe_2O_4$ for the intended application. After selected milling times, a small amount of powder was removed from the vial for analysis. The chemical analysis of these samples confirmed that they have very low levels of impurity.

3. Results and discussion

3.1. X-Ray diffraction Analysis.

The precipitated fine particles were characterized by XRD as shown in Fig. 1. The structure and their crystallite size were evaluated. The crystallite size of the nano-crystalline samples was measured using Debye-Scherrer formula [23],

$$D = \frac{0.9\lambda}{\beta \cos\theta} \quad (1)$$

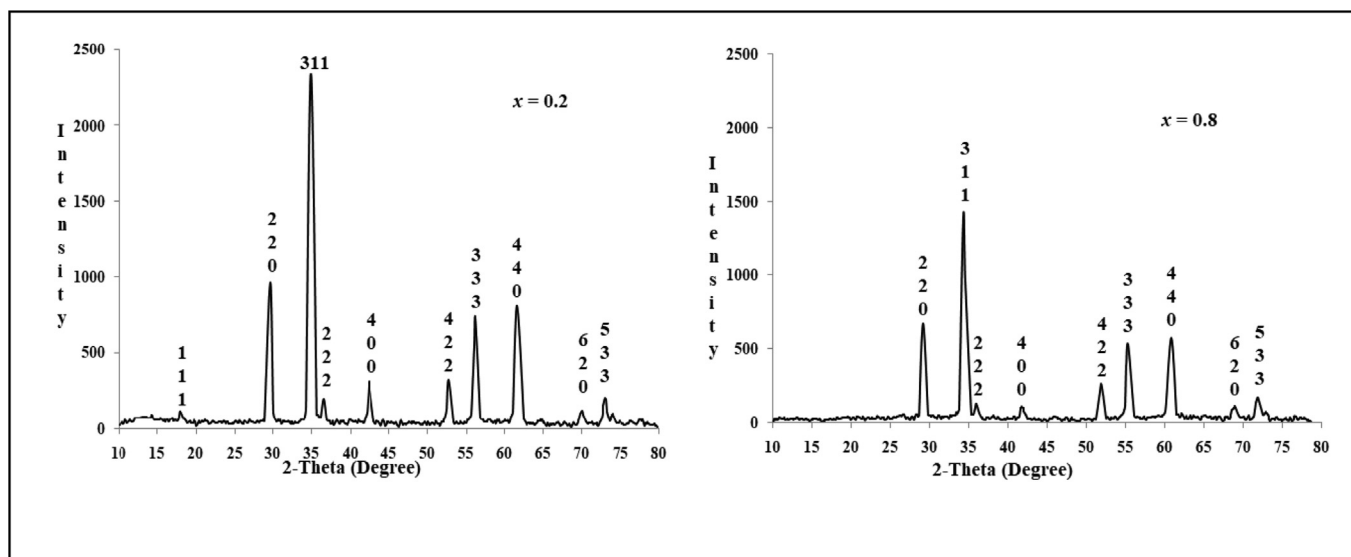


Fig. 1. XRD Pattern of $Cd_x Zn_{1-x} Fe_2 O_4$ Where $x = 0.2$ and 0.8 .

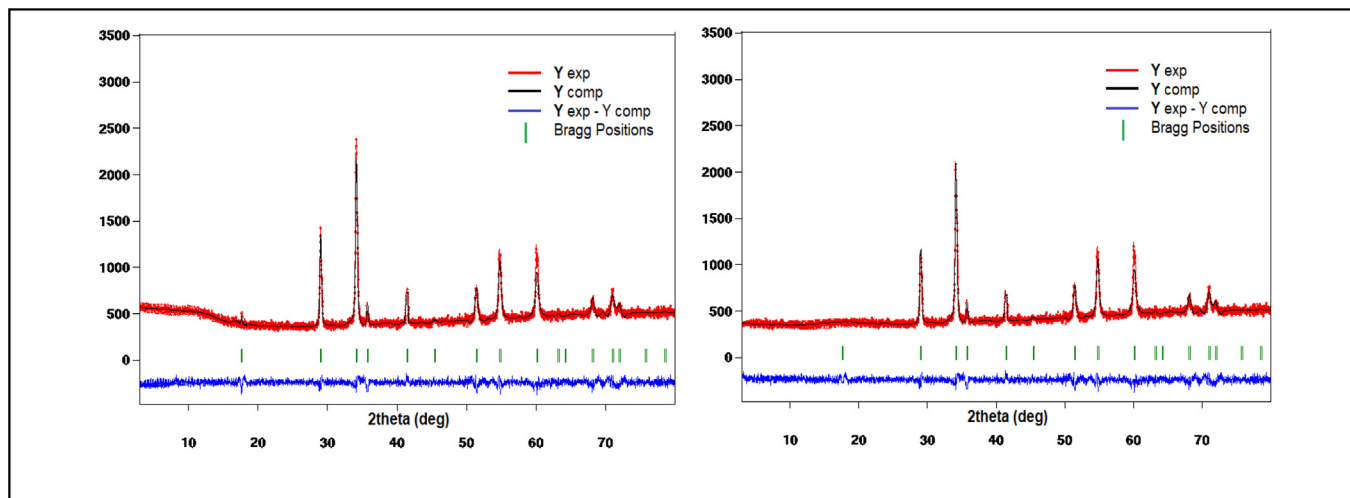


Fig. 2. XRD refinement pattern of $Cd_xZn_{1-x}Fe_2O_4$ where $x = 0.2$ and 0.8 .

Table 2

Tabular Representation of Cation Distribution and Magnetic Parameter of Cd-Zn Ferrites.

Composition	Cation Distribution	Lattice Parameter (Å)	Crystalline Size (nm)	Saturation magnetization (emu/g)	Coercivity (Gauss)	Magnetic moment μ_B (BM)	Nature of Spinel Ferrite
$Cd_{0.2}Zn_{0.8}Fe_2O_4$	$(Cd_{0.188}Zn_{0.632}Fe_{0.18})_{tet}$ $[Cd_{0.012}Zn_{0.168}Fe_{0.182}]_{oct}$	8.51	19.48	40.16	10.104	0.186	Mixed
$Cd_{0.8}Zn_{0.2}Fe_2O_4$	$(Cd_{0.688}Zn_{0.012}Fe_{0.30})_{tet}$ $[Cd_{0.112}Zn_{0.188}Fe_{0.170}]_{oct}$	8.67	21.42	10.27	1.0194	0.062	Mixed

Where ' λ ' is the wavelength of X-ray used in Å, ' β ' is the full width at half-maximum (FWHM) in radians for 2θ scale, ' θ ' is the Bragg angle, ' D ' is the crystallite size in nm. The XRD data confirm the formation of the cubic phase spinel ferrite with space group Fd_3m (2 2 7). The given XRD graph intensity reveals that highly crystalline character of the sample. The peaks could be indexed as (1 1 1), (2 2 0), (3 1 1), (2 2 2), (4 0 0), (4 2 2), (5 1 1), (4 4 0), (6 2 0) and (5 3 3) are major lattice planes, which are characteristics of single-phase cubic spinel structure. The give XRD data also matched with standard JCPDS file no. 22-1063 and 22-1012 confirms it. In our present study, the ferrite compounds Cd-Zn were synthesized using Urea as a standard fuel. Further, compound was calcinated at 800 °C for 4 h [3]. The synthesized compounds were grinded in a mortar pestle for 6 h to get a fine size compound Table 1. The Crystalline size of synthesis nanoparticles was calculating with the Debye-Scherrer formula. It was found that the particle size increases from 19.48 nm to 21.42 nm with doping concentration.

The same XRD data of synthesized ferrite nanocrystals has been refined by using the Rietveld refinement method shown in Fig. 2. The method is useful to identify some parameters like structural analysis, cation distribution and lattice parameter of given samples. It was seen that the lattice parameters increase for larger Cd^{2+} contents. This increase can be attributed to a larger ionic radii of Cd^{2+} (0.97 Å) relative to Zn^{2+} (0.82 Å); this is consistent by Tehrani F. S. et al. (2012) [7]. In addition, because the ionic radius of Cd^{2+} is larger than the ionic radius of Zn^{2+} substitution leads to larger expansion of the lattice. It is observed that from Fig. 1 the intensity of prominent peak (3 1 1) going to decrease as well as shifting of same peaks from higher theta to lower theta value. The reason behind using Bragg's law state that the lattice parameter is inversely proportional to the theta value at constant wavelength and inter-planar distance value. Due to variation of ionic radii of doping ions the shifting in peaks are directly observed. At the same time, the

migration of metallic ions (shown in Table 2) from tetrahedral to octahedral sites also affected the intensity of XRD peaks.

3.2. FTIR analysis

The recorded FTIR spectra at room temperature in the range of 400–4000 cm^{-1} for the Cd-Zn ferrite samples are shown in Fig. 3. In the IR band, variation in spectrum is usually assigned due to vibrations of ions in the crystal lattice studied by Brabers V.A. (1969) et al. [8]. Two main broad cation-oxygen bands are seen in the IR spectra of $Cd_xZn_{1-x}Fe_2O_4$ (where $x = 0.4$ and 0.8) in the frequencies ν_1 and ν_2 arises due to the octahedral and tetrahedral positions. They frequently appear in the range 390–450 and 540–600 cm^{-1} for octahedral and tetrahedral position respectively mention by Naseri et al. (2015) [9]. In the present case, the peak appear at 410 cm^{-1} and 420.1 cm^{-1} (ν_2) and 579.14 cm^{-1} and 559.25 cm^{-1}

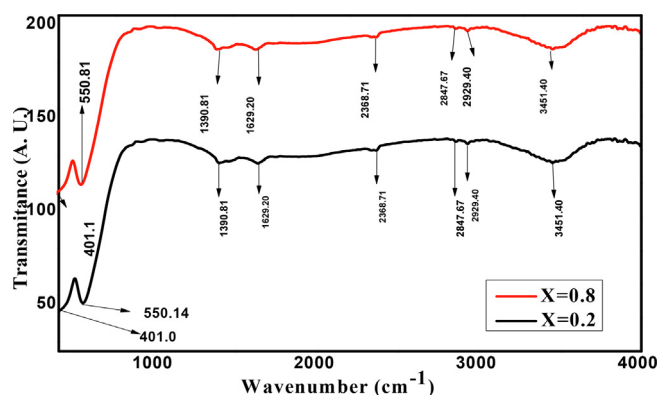


Fig. 3. FTIR spectra of $Cd_xNi_{1-x}Fe_2O_4$ ($x = 0.4$ and 0.8) spinel ferrites.

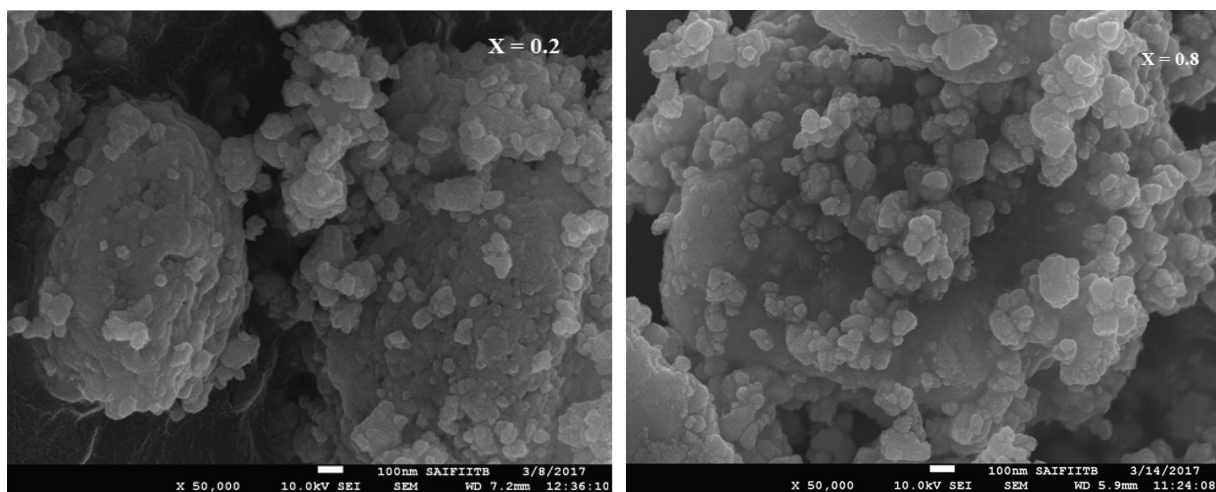


Fig. 4. SEM Micrograph of $Cd_xZn_{1-x}Fe_2O_4$ Ferrites.

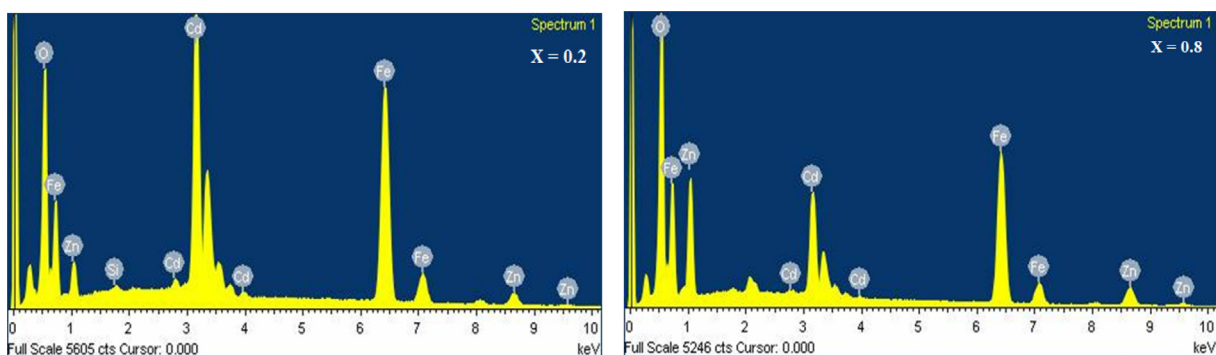


Fig. 5. EDX patterns of $Cd_xZn_{1-x}Fe_2O_4$ spinel ferrites where $x = 0.2$ and 0.8 .

(ν_1) in case of $x = 0.2$ and 0.8 respectively. The peaks at about $2847\text{--}2929$, 2368 and $1390\text{--}1629\text{ cm}^{-1}$ are due to C–H stretching, O–H stretching, C–H, C–O and O–H bending vibrations respectively. Broad band near 34500 cm^{-1} correspond to O–H stretching vibrations ascribed for water molecule presence in the sample [10,11].

3.3. Morphological study

The morphological properties of the synthesized spinel ferrite samples are recorded, analyzed and studied. We were curious to know the effect of nano particle size on the magnetic properties of the samples. Typical FE-SEM image of the sample Cd-Zn synthesis via *sol-gel* annealed at $800\text{ }^\circ\text{C}$ is shown in Fig. 4. The investigation of sample mounted on a JEOL-JSM 6100 IIT Bombay scanning electron microscope (SEM) operating between 35 kV . The image reveals that the particles have an almost regular shape and homogeneous distribution. The synthesis samples have magnetic in nature. The magnetic attraction affects better distribution across the particles and cause of agglomeration studied by S. Amiri (2013) [12]. It is also observed that some agglomeration in images is a function of calcinations temperature [13,14].

3.4. Elemental analysis

The element composition of the synthesized $Cd_xZn_{1-x}Fe_2O_4$ spinel ferrite has been investigated by the energy dispersive X-ray analysis (EDX) shown in Fig. 5. The EDX spectra of cadmium ferrite nanoparticles calcinated at $800\text{ }^\circ\text{C}$ revealed the presence of Cd, Zn, Fe, and O peaks in the sample. It has been confirmed the presence of metallic cations in given compound. For all the sample EDX result shows almost the same ratio of chemical was taken stoichiometry. The atomic weight percentage of cation in the investi-

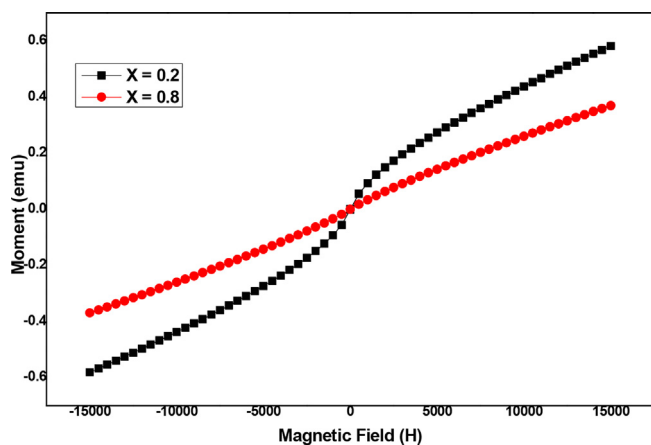


Fig. 6. M-H hysteresis curve of $Cd_xZn_{1-x}Fe_2O_4$, where $x = 0.2$ and 0.8 .

gated samples is found to be correct which match up to the expected composition ratio [11,12].

3.5. Magnetic study

The magnetic properties of the synthesized nanoparticles are analyzed using a Vibrational Sample Magnetometer (Lakeshore VSM 7410, SAIF IIT Madras) at room temperature (300 K) in the range of approximately – 1500 to + 1500 Gauss. Fig. 6 shows the M-H curves of the prepared Cd-Zn nanocrystals. The coercivity (H_c) and saturation magnetization (M_s) values have been directly extracted from these curves and have been listed in Table 2 for $x = 0.2$ and 0.8 concentrations of Zn^{2+} . This table indicates that the saturation magnetization decreases while increasing the concentration of Cd^{2+} metallic ions. The minimum value of saturation magnetization for a given spinel sample is found in the $Cd_{0.8}Zn_{0.2}Fe_2O_4$ nanocrystals. In case of Cd-Zn nano ferrites, the nanoparticles revealed almost zero retentivity and low coercivity. The external magnetic field of 15 kOe is not enough to saturate the sample (at 300 K). There are several factors imprison on saturation occur; they are 1) very small particles in the nano range distribution and pinning of magnetic spins on the surface of the particles, 2) with respect to doping concentration, cation redistribution of metallic ions along with octahedral and tetrahedral sites, [15,16].

The nature of given hysteresis loops shows a magnetic switching behavior. In Cd-Zn samples magnetization suddenly drops to almost negligible values with external magnetic field. Such type of graphical behavior can be explained on the basis of refinement data tabulated in table 2. It is observed from cationic distribution that the occupation of metallic ions mixed in both tetrahedral as well as octahedral sites. The given Cd and Zn are having non magnetic nature and only Fe has magnetic in nature. The total magnetic moment due to mixed nature of samples going to shows very lower value. This type of nature makes them ideal for switching applications [10]. On the basis of application part, there are three biosensors that employ magnetic nano particle labels with different sensing principles and instrumentation: (i) magnetic relaxation switches, [17,18] (ii) magneto-resistive sensors [19,20] and (iii) magnetic particle relaxation sensors [21,22,23].

4. Conclusion

The given cadmium doped Zinc ferrite sample have been successfully synthesized using the *sol-gel* auto combustion technique. Cadmium substitution has brought about a remarkable improvement in the structural and magnetic properties of zinc ferrite. The XRD analysis confirmed the formation of a nanocrystalline cubic spinel structure. They frequently appear in FTIR spectra help to verify the variation in cationic distribution. The crystallite size of synthesized nanoparticles has been calculated by the Debye-Scherrer formula found to be in nano range. The SEM micrographs

indicate the morphology of synthesis samples. Saturation magnetization, coercivity and remnant magnetization were found to be decreased with increasing non-magnetic cadmium content. Coercivity with small values revealed that the prepared nanomaterials $Cd_xZn_{1-x}Fe_2O_4$ have soft magnetic nature.

CRedit authorship contribution statement

A.K. Nandanwar: Data curation, Writing - original draft. **D.L. Chaudhary:** Conceptualization, Methodology, Software, Visualization, Investigation. **S.N. Kamde:** Software, Validation, Writing - review & editing. **D.S. Choudhary:** . **K.G. Rewatkar:** Supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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... स्त्री-पुरुष असमानता आणि भारतीय राजकारणात स्त्रियांचा सहभाग

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प्रस्तावना

19 व्या शतकात समाजसुधारकांच्या सुधारणावादी धोरणांनी स्त्रियांना सामाजिक अवकाश प्राप्त झाले. शतकानुशतकांच्या उपेक्षित व वंचित जीवनाचा शेवट करण्यासाठी स्त्रियांनी विविध चळवळी उभ्या केल्या. सामाजिक सुधारणांमुळे ती केवळ शिक्षितच झाली नाही तर स्वतःकडे, जीवनाकडे, व सामाजिक प्रश्नांकडे बघण्याची तिला दृष्टी प्राप्त झाली. स्त्रिया आर्थिक, बौद्धिक, भावनिक, सामाजिक प्रगतीच्या मार्गावर आल्या. भारतीय समाजात स्त्रियांना संधी मिळाली तर अनेक क्षेत्रे काबीज करू शकतात हे या शतकातील स्त्रियांनी सप्रमाण सिद्ध केले आहे. अर्थकारण, समाजकारण, शिक्षण, विज्ञान, तंत्रज्ञान, उद्योग, व्यवसाय इत्यादी सर्वच क्षेत्रात स्त्रियांनी पुरुष व्यवस्थेला बगल दिली आहे. भारतीय राज्यघटनेने सामाजिक समतेबरोबरच स्त्री पुरुष समानतेचा पुरस्कार केला आहे. परंतु ही समता स्त्रियांच्या बाबतीत अजूनही आभासी आहे, असे म्हटले तर वावगे ठरणार नाही. विविधतेने नटलेल्या भारत देशात विषमतांची व्यापकता आणि दाहकता तितकीच मोठ्या प्रमाणात जाणवते ही वस्तुस्थिती नाकारून चालणार नाही. आज २१ व्या शतकात आर्थिक, सामाजिक, धार्मिक, राजकीय, सांस्कृतिक अशा सर्वच क्षेत्रात स्त्रियांप्रती विषमता मोठ्या प्रमाणात वाढलेल्या दिसतात. तेव्हा प्रस्तुत शोध निबंधातून लिंग भेदावर आधारित विषम वितरण

व्यवस्थेत स्त्रियांच्या राजकीय सत्ताहीनतेचे विवेचन करण्यात येईल. प्रस्तुत शोधनिबंध तीन भागात लिहिला असून त्यातील पहिल्या भागात विषयाचे महत्त्व स्थान व जबाबदार घटक नमूद केले आहे. दुस-या भागात निष्कर्ष व तिस-या भागात व उपाययोजना नमूद केले आहे.

उद्दिष्टे :

1. राजकारणातील पुरुषप्रधान व्यवस्थेचा प्रभाव अभ्यासणे.
2. स्त्रियांच्या राजकीय सत्ताहीनतेस जबाबदार घटकांचा शोध घेणे.
3. स्त्रियांची वर्तमान राजकीय परिस्थिती समजून घेणे.
4. स्त्रीपुरुष असमानता व जाती व्यवस्थेचा संबंध अभ्यासणे.
5. लिंगभेदावर आधारित राजकीय सत्ता सहभागाचा प्रभाव अभ्यासणे.
6. विषम वितरण व्यवस्था समजून घेणे.

गृहीतके :

स्त्रीपुरुष असमानतेतून उत्पन्न व्यवस्था ह्या स्त्रियांच्या राजकीय सत्ताहीनतेस जबाबदार असतात.

अभ्यासाचे महत्त्व :

स्त्री आणि पुरुष यांच्यामध्ये जे शारीरिक भेद आहेत त्यांना आपण लैंगिक फरक म्हणतो. मात्र समाजात त्यांच्यात जे वेगवेगळ्या प्रकारचे भेद आहेत त्यांना आपण लिंगभाव फरक आहेत असे म्हणतो¹ आणि हा लिंगभाव फरक स्त्रियांप्रती गौणत्व निर्माण

करतो. वर्तमान सामाजिक परिस्थितीमध्ये स्त्रियांप्रती सामाजिक वैचारिकता दिसत असली तर विषमताही तितक्याच व्यापक प्रमाणात वाढताना दिसतात. स्त्रियांचे अस्तित्व धोक्यात आणणा-या सामाजिक,जातीय व लैंगिक अत्याचाराच्या घटना आपल्या सभोवताल मोठ्या प्रमाणात घडताना दिसतात. स्वातंत्र्यानंतर सर्वैधानिक मूल्यांचा आधार घेऊन स्त्रियांनी अनेक सत्ताकेंद्र काबीज केले, प्रगतीच्या नव्या व्याख्या व वळणे त्यांनी निर्माण केले. परंतु असमान विषम व्यवस्थेमध्ये त्या अजूनही खिंतपत पडलेल्या दिसतात. जातीय व लिंगभावी विषमतेच्या दुष्टचक्राचा प्रभाव त्यांच्यावर आहे. भारतीय समाजामध्ये जाति व्यवस्थेचा प्रश्न आणि स्त्रीपुरुष समानतेचा प्रश्न हे दोन्ही एकमेकांशी घट्ट बांधलेले आहे. त्यामुळे या व्यवस्थेवर आधारित स्त्रियांप्रति सर्वच क्षेत्रातील सत्ताहीनता प्रकर्षाने जाणवते. राजकारण सुद्धा या क्षेत्राला अपवाद नाही.तेव्हा स्त्रियांचा राजकारणातील सहभाग, प्रभाव, निर्णयक्षमता, कार्यक्षेत्र, हक्क, अधिकार, संधी इत्यादींमधील दुय्यमत्व या दृष्टीने विचार होणे अत्यंत महत्वाचे आहे. जवळपास ५० टक्के लोकसंख्येमध्ये सहभागी असलेल्या स्त्रिया राजकीय क्षेत्रात पिछाडीवर असलेल्या दिसतात व यामधून त्यांची सत्ताहीनता जाणवते या पार्श्वभूमीवर राजकीय सत्ताहीनतेच्या जबाबदार घटकांचा शोध घेणे महत्वाचे ठरते.

स्त्रियांची वर्तमान राजकीय परिस्थिती :

डॉ. बाबासाहेब आंबेडकर यांच्या मते, 'कोणताही समाज किती प्रगतिशील व विकसित आहे याचे मोजमाप त्या समाजातील स्त्रियांचे स्थान व दर्जा यावरून केले जाते.'² आधुनिक शतकात स्त्रियांचे स्थान व दर्जा निश्चितच बदलेला दिसत असला तरी तो समाज पूर्णपणे विकसित झाला असे म्हणता येणार नाही. आज स्त्रियांची सत्तास्थाने बदलेली आहे. फार पूर्वी असलेले 'चूल आणि

मूल' हे तिचे कार्यक्षेत्र स्त्रीने कधीचेच मागे टाकले. आकाशाला गवसणी घालणा-या क्षेत्रापर्यंत ती जाऊन पोहचली. जगातील आढानात्मक विकास व बदलांच्या प्रक्रियेत स्त्रियांचा वाढता सहभाग हे सुदृढ जीवनाचे प्रतिबिंब आहे.विकासाची ही एक बाजू आहे. तर दुसरी बाजू तितकीच या समाजव्यवस्थेचे भयावह रूप स्पष्ट करते. एकीकडे प्रगतीचा वेग झपाट्याने वाढतो तर दुसरीकडे या प्रगतीच्या प्रक्रियेत स्त्रिया असंख्य बाबतीत मात्र मागे पडतांना दिसतात. प्रामुख्याने स्त्रिया सामाजिक व सांस्कृतिक पटलावर जितक्या रममाण होताना दिसतात तितक्या त्या राजकीय पटलावर रममाण होताना दिसत नाही. राजकीय क्षेत्रातील तिचे स्थान व दर्जा, दुय्यमत्व, उपेक्षा, निर्णयक्षमता, प्रभाव आणि संधी या बाबतीत कमालीची विषमता व असमानता बघायला मिळते.

'भारतीय संविधानाने स्त्रियांचे हक्क व अधिकार सुरक्षित केल्यामुळे समाजात तिला संधी व समानतेचे अवकाश मिळाले,पण हे हक्क व अधिकार ज्या सामाजिक परिस्थितीत बजावले जातात, ती परिस्थिती पूर्णपणे प्रतिकूल आहे'³ स्त्रियांच्या योगदानाशिवाय लोकशाहीस इतर राजकीय, आर्थिक व सामाजिक व्यवस्था मजबूत व सक्षम बनू शकत नाही. 'स्त्रिया ह्या राष्ट्राच्या शिक्षक व रक्षक होत'⁴ अशा परिस्थिती स्त्रियांच्या राजकीय समता व सहभागाविषयी व अधिकार व संधी विषयी फारशी सकारात्मक चर्चा होताना दिसत नाही.

जगाच्या राजकीय पटलावर महिला पुरुषांपेक्षा कोणत्याही बाबतीत कमी नाहीत, याची अनेक राजकीय उदाहरणे आहेत. जर्मनीच्या अन्जेला मेकॅल, ऑस्ट्रेलियाच्या, जुलिया गीलार्ड, बांगलादेशाच्या शेख हसीना, लोकशाहीसाठी लढणा-या म्यानमारच्या नेत्या ऑंग सॉंग क्यू , भारताच्या इंदिरा गांधी यांची

जगाच्या राजकारणात नोंद घेतली जाते. आज भारतात सोनिया गांधी, ममता बॅनर्जी, मायावती, प्रतिभाताई पाटील, उमा भारती, जयललिता, सुषमा स्वराज, वसुंधरा राजे, शीला दीक्षित, राबडीदेवी, किरण बेदी इत्यादि स्त्रिया प्रभावीपणे राजकीय नेतृत्व करताना दिसतात. आपआपल्या शक्तीनुसार महिलांनी राजकारणात उत्तम कामगिरी बजावलेली आहे. परंतु स्त्रिया राजकारणात उतरल्या म्हणजे त्यांच्या राजकीयपणावर शिक्कामोर्तब झाले असे होत नाही. राजकारणातील महिलांच्या सहभागाबाबत भारत 98 व्या क्रमांकावर आहे. आंतरसंसदीय संघटनेच्या अहवालामध्ये पाकिस्तान, नेपाल या शेजारील राष्ट्रांपेक्षा भारतातील राजकारणामध्ये महिलांचा समावेश कमी असल्याचे म्हटले आहे. भारताच्या विविध केंद्र सरकार मधील महिलांचे प्रमाण ⁵

इ.स	महिला मंत्र्यांची संख्या
1952	03
1957	03
1962	05
1967	05
1971	03
1977	02
1980	08
1984	05
1989	01
1991	05
1996	05
1998	04
1999	09
2004	10
2009	09

स्रोत : भारतीय संसद
भारतात महिलांची संख्या पुरुषांच्या आधी

असली तरी विविध सरकारच्या मंत्रीमंडळात महिलांची संख्या व टक्केवारी विचार करायला लावणारी आहे. 1952 च्या मंत्री मंडळात महिलांची संख्या तीन होती. 1957 च्या मंत्री मंडळात सुद्धा महिलांची संख्या तीनच होती. 1977 च्या निवडणुकीत केवळ दोनच महिला मंत्री म्हणून मंत्री मंडळात होत्या. 2004 च्या मंत्रीमंडळात केवळ दहा महिला मंत्री म्हणून होत्या. तर 2009 च्या मंत्रीमंडळात केवळ नऊ महिला मंत्री म्हणून होत्या. यावरून 1952 ते 2009 च्या मंत्रीमंडळाचे अवलोकन केल्यास असे लक्षात येते की महिलांचे भारतीय मंत्री मंडळात संख्या व टक्केवारी चिंताजनक होती .

●जबाबदार घटक :

●पुरुषप्रधान मानसिकता :

‘भारतातील स्त्रिया बहुविध पुरुष सत्तेला सामोरे जातात. पुरुषसत्ताक घरांमध्ये सत्ता प्रतिष्ठा दर्जा या गोष्टी त्यांच्या वाट्याला येत नाही त्यामुळे श्रमाच्या बाजारपेठेत कुटुंबांतर्गत स्त्रिया दुय्यम दर्जाच्या वाहक असतात.’⁶ याची प्रचिती पुरुषप्रधानसंस्कृती मध्ये बघायला मिळते. या संस्कृतीने महिलाना प्राचीन काळापासून अबला, दासी, सेवा करणारी उपभोगाची वस्तू म्हणून कायम तिच्याकडे पाहिले. विविध धर्मग्रंथातही तिला ला समान हक्क व अधिकारापासून वंचित ठरवले त्यामुळे तिची अधोगती झाली. ‘राजकारण आणि राजकीय संस्था, शासन संस्था, आणि राजकीय पक्ष हे सर्वच पितृसत्ताक व्यवस्थेचा भाग आहे’⁷ गावपातळी-वरील स्थानिक राजकारणामध्ये महिलांचा सक्रीय सहभाग पूर्वीपेक्षा वाढला असला तरी राज्य व देशपातळीवरील राजकारणातील सहभाग खरोखर चिंताजनक आहे. देशपातळी-वरील समस्या, गुंतागुंतीचा व्यवहार, सौदे-बाजीचा व्यवहार, शक्तीचा टकरावांचा किंवा मेळ घालण्याचा तिथे स्त्री कशी टिकणार?

कशी यशस्वी होणार? अशा राजकीय भाषेचा वापर समाजात सरसकट केला जातो. या देशात आर्थिक व राजकीय व्यवस्थेच्या नाड्या परंपरेपासूनच पुरुषप्रधान व्यवस्थेकडे असून सुद्धा विधिमंडळ व संसदेतील महिलांची संख्या हाताच्या बोटावर मोजण्याइतपत राहिली आहे. महिला सबलीकरण, स्त्रियांच्या प्रतिष्ठेची भाषा करणारे राजकीय पक्ष, राज्य आणि देशपातळी-वरील निवडणुकांमध्ये स्त्रियांना प्रतिनिधित्व देतांना उघड उघड हात आखडता घेतात. देशाची सर्वोच्च संस्था असलेल्या संसदेमध्ये महिलांचा ३३ टक्के आरक्षणाचा लढा अजून संपलेला नाही ही वस्तुस्थिती आहे समतेसाठी व्यक्तिगत संधी आणि निर्णय स्वातंत्र्य ही महिलांच्या विकासाची साधने आहेत. परंतु वर्षानुवर्षांपासून याच महत्वाच्या साधनांपासून स्त्रियांना जाणीवपूर्वक लांब ठेवण्यात आले. 'बौद्धिक श्रम करण्यात स्त्रिया कोणत्याच बाबतीत मागे नाही मात्र त्यांना उच्च पदावर किंवा जबाबदारीच्या जागेवर पुरुषांच्या प्रमाणात फार कमी संधी मिळते'⁸ अशीच परिस्थिती भारतीय राजकारणाची आहे. राजकारणात स्त्रियांपेक्षा पुरुष दिसून येतात कारण स्त्रियांचे राजकारणात काहीच काम नाही, असे मानून तिला त्या पातळीवरील भूमिका नाकारणे हे पारंपारिक पुरुषी मानसिकतेचे दर्शन आहे. आज स्त्री आणि पुरुष विषमतेच्या निर्देशांका-मध्ये जगात भारताचा 148 पैकी 138 व क्रमांक लागतो निवडणुकीच्या राजकारणाचे सार्वजनिक क्षेत्र हे बाहुबल गुन्हेगारी आणि अवैध मार्गाने व्यापलेले आहे. ते स्त्रियांसाठी सुरक्षित नाही म्हणून त्यातून स्त्रियांना दूर ठेवावे लागते. अशी बोलणारे काही मातब्बर राजकीय मंडळीची संख्या या देशात कमी नाही. आजपर्यंत च्या सार्वत्रिक निवडणुकांमधून स्त्रियांच्या प्रतिनिधित्वाच्या चर्चा झाल्या, परंतु राजकीय सक्षमीकरणासाठी आवश्यक अशी ठोस पाऊले उचलली गेली नाही. त्यामुळेच आजवर प्रमुख राजकीय

पक्षांनी स्त्रीयांना नगण्य प्रमाणात उमेदवारी दिली. स्त्रियांच्या राजकीय आरक्षणाचे यश देखील बऱ्याच अंशी राजकीय पक्षांच्या इच्छाशक्तीवरच अवलंबून होते व आहे.⁹ यावरून राजकारणावर असलेला पुरुष प्रधानतेचा प्रभाव लक्षात येतो.

सामाजिक परिस्थिती :

राजकारणात सक्रिय होण्यासाठी आवश्यक असलेल्या सामाजिक व कौटुंबिक परिस्थितीमध्ये आजही बदल झालेला दिसत नाही. याला अपवाद राजकीय घराणे आहेत. या घराण्यातून येणाऱ्या महिलांना पूर्ण पाठिंबा मिळतो. सुप्रिया सुळे, प्रणिती शिंदे, प्रियांका गांधी या स्त्रिया घराणे शाहीच्या उत्तम उदाहरणे आहेत. इतर परिस्थितीमध्ये मात्र चित्र वेगळे आहे. 'स्त्रिया आणि राजकारण ह्यांच्या परस्पर संबधाचा विचार करत असताना केवळ राजकीय व्यवस्थेमध्ये स्त्रियांचे स्थान काय राहिले किंवा त्यात स्त्रिया कितपत प्रभावी ठरल्या आहेत. इतका मर्यादित परिप्रेक्ष ठेवून चालणार नाही त्यांच्या बरोबर ह्या अन्यायकारक वर्गभेद, जात, जमात, लिंगाधारीत भेदभावावर आधारित श्रेणीबद्ध व्यवस्थेला आव्हान देणे सुद्धा एक प्रकारचे राजकारणच आहे.'¹⁰ भारतीय संविधानात महिलांच्या सर्वांगीण विकासासाठी विविध कलमान्वये समानता प्रस्थापित करण्याच्या तरतुदींचा समावेश केला आहे. ज्यामध्ये कलम १४ अन्वये जात, धर्म, लिंग, आणि वंश या आधारावर कोणताही भेदभाव करता येणार नाही. असा स्पष्ट उल्लेख करण्यात आला असतांना सुद्धा स्त्रियांच्या बाबतीत सर्व प्रकारच्या विषमता समाजात पक्क्या होताना दिसतात. प्रत्यक्षात धर्म, जात, वर्ग वर्ण यांच्यातून जितके तुकडे होतील तितके आजच्या राजकारणाला हवेच आहे. निवडणूक लढविताना होणारे अर्थकारण खर्चातील आकडे विस्मयकारक असतात. निवडणुकीतील उमेदवारीसाठी स्पर्धा,

जिकण्याचे निकष व त्यातील प्राधान्यक्रम हे बदलेले आहे. त्या स्तरावर किती स्त्रिया टिकू शकतात हा खरा प्रश्न आहे. राजकीय गटातटाच्या व दबावतंत्राच्या राजकारणात उतरणे स्त्रियांसाठी कसोटी असते, कारण सामाजिक दृष्ट्या गटातटाच्या राजकारणाचा अनुभव हा फारसा चांगला नसतो. आणि त्यामुळे बहुतांश स्त्रीया राजकारणाकडे नकारात्मक दृष्टीकोनातून बघतात. कारण राजकारणाचा घसरलेला दर्जा व बदललेला राजकीय पोत स्त्रियांच्या पचनी पडण्यासारखा नाही.

• जातीव्यवस्था आणि लिंगभाव :

२१ व्या शतकातील जातिव्यवस्थेचा प्रश्न हा संपूर्ण लोकशाही समाजाची कसोटी पाहणारा प्रश्न आहे. डॉ. आंबेडकरांच्या मते, 'स्त्री ही जातीव्यवस्थेचे दार आहे' आणि हे विधान सगळ्याच भेदभाव करणा-या राजकारणाच्या मुळाशी असलेले सत्य म्हणूनही पाहता येते. आपली स्त्री आणि दुस-यांची स्त्री अशा राजकारणातून स्त्रीयांना एका समुदायाचे मानक बनविणे किंवा त्यांचे वर्चस्व प्रस्थापित करण्यासाठी दुस-या समुदायातील स्त्रियांची विटंबना करणे हे घडताना दिसते'^{११} जाति व्यवस्थेमुळेच लिंगभेदासारखे प्रश्न निर्माण होतात व यामधून विषम वितरणाच्या व्यवस्था पक्क्या होतात. २००६ मध्ये घडवून आणलेले खैरलांजी प्रकरण हे जात आणि लिंगभावाचे ज्वलंत उदाहरण आहे. स्थानिक स्वराज्य संस्थामधून स्त्रियांना राजकारणात आपले स्थान टिकवून ठेवण्यासाठी पुरुषप्रधान व जातीप्रधान या दोन्ही व्यवस्थेसोबत लढा द्यावा लागतो. त्यातही दलित, गरीब, आदिवासी, भटके, अल्पसंख्यांक इत्यादी परीघावर असणाऱ्या स्त्रियांचे विदारक अनुभव आहे. स्त्रीयांना खुर्चीवर बासू न देणे, दलित असेल तर पाणी वेगळे ठेवणे, स्वातंत्र्य दिनी तिच्या हस्ते होणा-या झेंडावंदन कार्यक्रमावर बहिष्कार

घालणे, बैठकीचा निरोप न पाठविणे, घेतलेल्या निर्णयावर शिक्कामोर्तब करण्यासाठी नोंदवही घरी पाठविणे, आणि निवडून आलेल्या स्त्री ऐवजी तिच्या घरातील पुरुष पुढा-याने उघड उघड कारभार करणे हे सुरवातीला जसे झाले तसे आजही कमी जास्त प्रमाणात चालू आहे.^{१२} संसदेतील ३३ टक्के आरक्षणाचा प्रश्न हा जातीय व लिंगभावाचा प्रश्न आहे. तेव्हा राजकारण स्थानिक असो किंवा देश असो पातळीवरील, जात व लिंगभावावर आधारित स्त्रियांचे दुय्यमत्व प्रकर्षाने दिसते.

निष्कर्ष :

१९९० नंतर स्त्रिया राजकारणात आल्या, निर्णयप्रक्रियेला समजून घेऊ लागल्या. परंतु स्त्रियांना निर्णय घेता येतात ती अधिकार गाजवू शकते ही वस्तुस्थिती समाजाने आत्मसात केलेली नाही. राजकारणातील महिलांच्या सक्रिय सहभागाचे चित्र नक्की वेगळे असेल असा विश्वास गेल्या काही वर्षांपासून दिसून येत आहे. ७२ व्या आणि ७३ व्या घटना दुरुस्तीने स्त्रियांसाठी एक प्रचंड सामाजिक व राजकीय अवकाश निर्माण केला आहे. स्थानिक स्वराज्य संस्थामधील आरक्षणा-मुळे शहरी व ग्रामीण भागातील महिलांचा राजकीय सहभाग वाढला पण ज्या संस्थामध्ये स्त्री जीवनावर परिणाम करणारे कायदे तयार केले जातात. तिथे मात्र तिचा सहभाग अल्प आहे. स्त्रियांच्या राजकीय सहभागाचे दुय्यमत्व लोकशाही पुढील फार मोठे आव्हान ठरू शकते. राजकीय प्रक्रियेत महिलांचा समान पातळीवरील सहभाग असल्या शिवाय लोकशाही समृद्ध होऊ शकत नाही. लोकशाही प्रक्रिया ही तेव्हाच परिणामकारक होऊ शकते जेव्हा तिथे सर्व प्रकारच्या विषमता नष्ट होऊन समान पातळीवरील स्त्रीपुरुष सहभाग वाढीस लागेल. समता, शाश्वत विकास, शांती निर्माण करण्यासाठी स्त्रियांचा राजकारणात सक्रीय सहभाग अत्यंत महत्त्वाचा आहे. आणि केवळ

राजकीयच प्रश्न सोडविण्यासाठी सहभाग महत्वाचा नाही तर आर्थिक, सामाजिक, शैक्षणिक, सांस्कृतिक, न्यायालयीन प्रश्न मार्गी लागण्याठी स्त्रियांचा राजकीय सहभाग वाढणे ही काळाची गरज आहे. पण पुरुषप्रधान संस्कृतीत महिलांना पुढे येण्यासाठी कराव्या लागणाऱ्या संघर्षात त्यांची मोठी शक्ती खर्च होते. राजकारणातील पुरुषप्रधानता, जाती व्यवस्था व लिंग भेदासारखे प्रश्न स्त्रियांच्या सार्वजनिक जीवनावर परिणाम करतात. यामधून स्त्रिया केवळ राजकारण नव्हे तर सामाजिक आर्थिक, धार्मिक, सांस्कृतिक, व्यवस्थेतील विषम वितरण व्यवस्थेच्या बळी होतात. या व्यवस्थेमधील निर्णय, हक्क, संधी, स्वातंत्र्य, जबाबदारी, कर्तव्य, उत्पन्न इत्यादीच्या विषम परिस्थिती मध्ये असतात. संसदेतील 1952 ते 2014 पर्यंतच्या लोकसभेतील स्त्री सहभागाची आकडेवारी पाहता असे लक्षात येते की, स्त्रीपुरुष असमानतेचे सर्वात मोठे क्षेत्र संसदेने व्यापले आहे. स्त्रियांच्या आयुष्यावर परिणाम करणारे कायदे ज्या संसदेत निर्माण होतात तिथेच स्त्रियांचे अत्यल्प प्रमाण आहे. याशिवाय ती सर्वच क्षेत्रातील निर्णय क्षमतेच्या शेवटच्या टोकावर आहे हे सत्य नाकारून चालणार नाही. या सर्व चर्चेच्या विश्लेषणावरून हे सिद्ध होते की, स्त्री पुरुष असमानते मधून उत्पन्न होणा-या विषम व्यवस्थे मध्ये स्त्रिया राजकीय पटलावर सक्रीय होताना दिसत नाही. परिणामी स्त्रिया राजकीय दृष्ट्या सत्ताहीन होताना दिसतात.

उपाययोजना :

स्त्रियांचा राजकीय विकास होणे ही काळाची गरज आहे हे मान्य करावेच लागेल. स्त्रियांना राजकीय सक्षम करुणच आपण समाज व राष्ट्र शक्तीशाली करू शकतो. स्त्रियांचा राजकीय सहभाग, त्यांना संरक्षण, आर्थिक उन्नती, त्यांच्या क्षमतांचे संवर्धन या सर्वांसाठी अनुकूल वातावरण निर्माण करेल.

तेव्हा शासन, समाज, कुटुंब इत्यादींनी स्त्रीयांप्रती उच्च कोटीची सकारात्मक मानसिकता ठेवणे आवश्यक आहे. जातीव्यवस्था कायम ठेवून समतेवर आधारित समाज उभा करणे शक्य नाही त्यासाठी समाजातील सर्वच जाती धर्मातील लोकांनी स्त्रियांचा दर्जा, हक्क ,अधिकार, स्वातंत्र्य, समता, न्याय इत्यादी बाबत जागृती होणे गरजेचे आहे. स्त्रीयांप्रती रूढी प्रथेवर आधारित असलेली मानसिकता बदलणे गरजेचे आहे. स्त्रीपुरुष समतेच्या स्थापने साठी डॉ. आंबेडकर यांनी दिलेले संवैधानिक मुल्ये जबाबदारपणाने उपयोगात आणणे समाज व शासन कर्त्यांचे कर्तव्य आहे. गुणवत्तापूर्ण शिक्षण, स्त्रीयांच्या हक्क व अधिकाराचे रक्षण करणारे कायदे, शासकीय योजना, उपक्रम इत्यादी प्रयत्न सर्व स्तरावर होणे गरजेचे आहे. त्याचबरोबर रूढी, प्रथा व परंपरेच्या बंदिस्त भिंती तोडून स्त्रियांनी सुद्धा आपल्या हक्क व अधिकाराप्रती जागरूक असणे गरजेचे आहे. कारण 'विषमतेवर आधारलेली कोणतीही व्यवस्था कायम ठेवण्यात त्यातलं शोषितांचा सहभाग हा गरजेचा असतोच'¹³ तेव्हा स्त्रियांनी असुरक्षितता, परावलंबन, अशा नकारात्मक भावना न ठेवता अन्यायाला विरोध, प्रतिकार, स्वयंपूर्णता, स्वावलंबन याची जोपासना करायला हवी. कुटुंब पातळी पासून तर देश पातळी वरील महिलांच्या सामुहिक प्रयत्नांमधून राजकीय बदल घडवून आणणे शक्य आहे. या देशाची कायदे बनविणारी संसद स्त्रियांच्या समान सहभागा शिवाय पूर्ण होऊ शकत नाही. तेव्हा स्त्रियांनी या दिशेने विचार करणे गरजेचे आहे. आंतरराष्ट्रीय महिला दिवस, मातृ दिवस, व महिला संबंधित सण, उत्सव साजरे करून स्त्रियांचे प्रश्न संपणार नाही. तर पंचायत स्तरापासून तर देशपातळीवरील स्त्रियांचा राजकीय सहभाग वाढीस लागणारे पोषक, सर्वसमावेशक वातावरण निर्मिती होणे गरजेचे

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डॉ. आवेडकर महाविद्यालय दीक्षाभूमी नागपूर

प्रस्तावना

19 व्या शतकात समाजसुधारकांच्या सुधारणावादी धोरणांनी स्त्रियांना सामाजिक अवकाश प्राप्त झाले. शतकानुशतकांच्या उपेक्षित व वंचित जीवनाचा शेवट करण्यासाठी स्त्रियांनी विविध चळवळी उभ्या केल्या. सामाजिक सुधारणांमुळे ती केवळ शिक्षितच झाली नाही तर स्वतःकडे, जीवनाकडे व सामाजिक प्रश्नांकडे बघण्याची तिला दृष्टी प्राप्त झाली. स्त्रिया आर्थिक, बौद्धिक, भावनिक, सामाजिक प्रगतीच्या मार्गावर आल्या. भारतीय समाजात स्त्रियांना संधी मिळाली तर अनेक क्षेत्रे काबीज करू शकतात हे या शतकातील स्त्रियांनी सप्रमाण सिद्ध केले आहे. अर्थकारण, समाजकारण, शिक्षण, विज्ञान, तंत्रज्ञान, उद्योग, व्यवसाय इत्यादी सर्वच क्षेत्रात स्त्रियांनी पुरुष व्यवस्थेला बगल दिली आहे. भारतीय राज्यघटनेने सामाजिक समतेबरोबरच स्त्री पुरुष समानतेचा पुरस्कार केला आहे. परंतु ही समता स्त्रियांच्या बाबतीत अजूनही आभासी आहे, असे म्हटले तर वावगे ठरणार नाही. विविधतेने नटलेल्या भारत देशात विषमतांची व्यापकता आणि दाहकता तितकीच मोठ्या प्रमाणात जाणवते ही वस्तुस्थिती नाकारून चालणार नाही. आज २१ व्या शतकात आर्थिक, सामाजिक, धार्मिक, राजकीय, सांस्कृतिक अशा सर्वच क्षेत्रात स्त्रियांप्रती विषमता मोठ्या प्रमाणात वाढलेल्या दिसतात. तेव्हा प्रस्तुत शोध निबंधातून लिंग भेदावर आधारित विषम वितरण

व्यवस्थेत स्त्रियांच्या राजकीय सत्ताहीनतेचे विवेचन करण्यात येईल. प्रस्तुत शोधनिबंध तीन भागात लिहिला असून त्यातील पहिल्या भागात विषयाचे महत्त्व स्थान व जबाबदार घटक नमूद केले आहे. दुस-या भागात निष्कर्ष व तिस-या भागात व उपाययोजना नमूद केले आहे.

उद्दिष्टे :

1. राजकारणातील पुरुषप्रधान व्यवस्थेचा प्रभाव अभ्यासणे.
2. स्त्रियांच्या राजकीय सत्ताहीनतेस जबाबदार घटकांचा शोध घेणे.
3. स्त्रियांची वर्तमान राजकीय परिस्थिती समजून घेणे.
4. स्त्रीपुरुष असमानता व जाती व्यवस्थेचा संबंध अभ्यासणे.
5. लिंगभेदावर आधारित राजकीय सत्ता सहभागाचा प्रभाव अभ्यासणे.
6. विषम वितरण व्यवस्था समजून घेणे.

गृहीतके :

स्त्रीपुरुष असमानतेतून उत्पन्न व्यवस्था ह्या स्त्रियांच्या राजकीय सत्ताहीनतेस जबाबदार असतात.

अभ्यासाचे महत्त्व :

स्त्री आणि पुरुष यांच्यामध्ये जे शारीरिक भेद आहेत त्यांना आपण लैंगिक फरक म्हणतो. मात्र समाजात त्यांच्यात जे वेगवेगळ्या प्रकारचे भेद आहेत त्यांना आपण लिंगभाव फरक आहेत असे म्हणतो¹ आणि हा लिंगभाव फरक स्त्रियांप्रती गौणत्व निर्माण

करतो. वर्तमान सामाजिक परिस्थितीमध्ये स्त्रियांप्रती सामाजिक वैचारिकता दिसत असली तर विषमताही तितक्याच व्यापक प्रमाणात वाढताना दिसतात. स्त्रियांचे अस्तित्व धोक्यात आणणा-या सामाजिक,जातीय व लैंगिक अत्याचाराच्या घटना आपल्या सभोवताल मोठ्या प्रमाणात घडताना दिसतात. स्वातंत्र्यानंतर सर्वैधानिक मूल्यांचा आधार घेऊन स्त्रियांनी अनेक सत्ताकेंद्र काबीज केले, प्रगतीच्या नव्या व्याख्या व वळणे त्यांनी निर्माण केले. परंतु असमान विषम व्यवस्थेमध्ये त्या अजूनही खिंतपत पडलेल्या दिसतात. जातीय व लिंगभावी विषमतेच्या दुष्टचक्राचा प्रभाव त्यांच्यावर आहे. भारतीय समाजामध्ये जाति व्यवस्थेचा प्रश्न आणि स्त्रीपुरुष समानतेचा प्रश्न हे दोन्ही एकमेकांशी घट्ट बांधलेले आहे. त्यामुळे या व्यवस्थेवर आधारित स्त्रियांप्रति सर्वच क्षेत्रातील सत्ताहीनता प्रकर्षाने जाणवते. राजकारण सुद्धा या क्षेत्राला अपवाद नाही.तेव्हा स्त्रियांचा राजकारणातील सहभाग, प्रभाव, निर्णयक्षमता, कार्यक्षेत्र, हक्क, अधिकार, संधी इत्यादींमधील दुय्यमत्व या दृष्टीने विचार होणे अत्यंत महत्वाचे आहे. जवळपास ५० टक्के लोकसंख्येमध्ये सहभागी असलेल्या स्त्रिया राजकीय क्षेत्रात पिछाडीवर असलेल्या दिसतात व यामधून त्यांची सत्ताहीनता जाणवते या पार्श्वभूमीवर राजकीय सत्ताहीनतेच्या जबाबदार घटकांचा शोध घेणे महत्वाचे ठरते.

स्त्रियांची वर्तमान राजकीय परिस्थिती :

डॉ. बाबासाहेब आंबेडकर यांच्या मते, 'कोणताही समाज किती प्रगतिशील व विकसित आहे याचे मोजमाप त्या समाजातील स्त्रियांचे स्थान व दर्जा यावरून केले जाते.'² आधुनिक शतकात स्त्रियांचे स्थान व दर्जा निश्चितच बदलेला दिसत असला तरी तो समाज पूर्णपणे विकसित झाला असे म्हणता येणार नाही. आज स्त्रियांची सत्तास्थाने बदलेली आहे. फार पूर्वी असलेले 'चूल आणि

मूल' हे तिचे कार्यक्षेत्र स्त्रीने कधीचेच मागे टाकले. आकाशाला गवसणी घालणा-या क्षेत्रापर्यंत ती जाऊन पोहचली. जगातील आढानात्मक विकास व बदलांच्या प्रक्रियेत स्त्रियांचा वाढता सहभाग हे सुदृढ जीवनाचे प्रतिबिंब आहे.विकासाची ही एक बाजू आहे. तर दुसरी बाजू तितकीच या समाजव्यवस्थेचे भयावह रूप स्पष्ट करते. एकीकडे प्रगतीचा वेग झपाट्याने वाढतो तर दुसरीकडे या प्रगतीच्या प्रक्रियेत स्त्रिया असंख्य बाबतीत मात्र मागे पडतांना दिसतात. प्रामुख्याने स्त्रिया सामाजिक व सांस्कृतिक पटलावर जितक्या रममाण होताना दिसतात तितक्या त्या राजकीय पटलावर रममाण होताना दिसत नाही. राजकीय क्षेत्रातील तिचे स्थान व दर्जा, दुय्यमत्व, उपेक्षा, निर्णयक्षमता, प्रभाव आणि संधी या बाबतीत कमालीची विषमता व असमानता बघायला मिळते.

'भारतीय संविधानाने स्त्रियांचे हक्क व अधिकार सुरक्षित केल्यामुळे समाजात तिला संधी व समानतेचे अवकाश मिळाले,पण हे हक्क व अधिकार ज्या सामाजिक परिस्थितीत बजावले जातात, ती परिस्थिती पूर्णपणे प्रतिकूल आहे'³ स्त्रियांच्या योगदानाशिवाय लोकशाहीस इतर राजकीय, आर्थिक व सामाजिक व्यवस्था मजबूत व सक्षम बनू शकत नाही. 'स्त्रिया ह्या राष्ट्राच्या शिक्षक व रक्षक होत'⁴ अशा परिस्थिती स्त्रियांच्या राजकीय समता व सहभागाविषयी व अधिकार व संधी विषयी फारशी सकारात्मक चर्चा होताना दिसत नाही.

जगाच्या राजकीय पटलावर महिला पुरुषांपेक्षा कोणत्याही बाबतीत कमी नाहीत, याची अनेक राजकीय उदाहरणे आहेत. जर्मनीच्या अन्जेला मेकॅल, ऑस्ट्रेलियाच्या, जुलिया गीलार्ड, बांगलादेशाच्या शेख हसीना, लोकशाहीसाठी लढणा-या म्यानमारच्या नेत्या ऑंग सॉंग क्यू , भारताच्या इंदिरा गांधी यांची

जगाच्या राजकारणात नोंद घेतली जाते. आज भारतात सोनिया गांधी, ममता बॅनर्जी, मायावती, प्रतिभाताई पाटील, उमा भारती, जयललिता, सुषमा स्वराज, वसुंधरा राजे, शीला दीक्षित, राबडीदेवी, किरण बेदी इत्यादि स्त्रिया प्रभावीपणे राजकीय नेतृत्व करताना दिसतात. आपआपल्या शक्तीनुसार महिलांनी राजकारणात उत्तम कामगिरी बजावलेली आहे. परंतु स्त्रिया राजकारणात उतरल्या म्हणजे त्यांच्या राजकीयपणावर शिक्कामोर्तब झाले असे होत नाही. राजकारणातील महिलांच्या सहभागाबाबत भारत 98 व्या क्रमांकावर आहे. आंतरसंसदीय संघटनेच्या अहवालामध्ये पाकिस्तान, नेपाल या शेजारील राष्ट्रांपेक्षा भारतातील राजकारणामध्ये महिलांचा समावेश कमी असल्याचे म्हटले आहे. भारताच्या विविध केंद्र सरकार मधील महिलांचे प्रमाण ⁵

इ.स	महिला मंत्र्यांची संख्या
1952	03
1957	03
1962	05
1967	05
1971	03
1977	02
1980	08
1984	05
1989	01
1991	05
1996	05
1998	04
1999	09
2004	10
2009	09

स्रोत : भारतीय संसद
भारतात महिलांची संख्या पुरुषांच्या आधी

असली तरी विविध सरकारच्या मंत्रीमंडळात महिलांची संख्या व टक्केवारी विचार करायला लावणारी आहे. 1952 च्या मंत्री मंडळात महिलांची संख्या तीन होती. 1957 च्या मंत्री मंडळात सुद्धा महिलांची संख्या तीनच होती. 1977 च्या निवडणुकीत केवळ दोनच महिला मंत्री म्हणून मंत्री मंडळात होत्या. 2004 च्या मंत्रीमंडळात केवळ दहा महिला मंत्री म्हणून होत्या. तर 2009 च्या मंत्रीमंडळात केवळ नऊ महिला मंत्री म्हणून होत्या. यावरून 1952 ते 2009 च्या मंत्रीमंडळाचे अवलोकन केल्यास असे लक्षात येते की महिलांचे भारतीय मंत्री मंडळात संख्या व टक्केवारी चिंताजनक होती .

●जबाबदार घटक :

●पुरुषप्रधान मानसिकता :

‘भारतातील स्त्रिया बहुविध पुरुष सत्तेला सामोरे जातात. पुरुषसत्ताक घरांमध्ये सत्ता प्रतिष्ठा दर्जा या गोष्टी त्यांच्या वाट्याला येत नाही त्यामुळे श्रमाच्या बाजारपेठेत कुटुंबांतर्गत स्त्रिया दुय्यम दर्जाच्या वाहक असतात.’⁶ याची प्रचिती पुरुषप्रधानसंस्कृती मध्ये बघायला मिळते. या संस्कृतीने महिलाना प्राचीन काळापासून अबला, दासी, सेवा करणारी उपभोगाची वस्तू म्हणून कायम तिच्याकडे पाहिले. विविध धर्मग्रंथातही तिला ला समान हक्क व अधिकारापासून वंचित ठरवले त्यामुळे तिची अधोगती झाली. ‘राजकारण आणि राजकीय संस्था, शासन संस्था, आणि राजकीय पक्ष हे सर्वच पितृसत्ताक व्यवस्थेचा भाग आहे’⁷ गावपातळी-वरील स्थानिक राजकारणामध्ये महिलांचा सक्रीय सहभाग पूर्वीपेक्षा वाढला असला तरी राज्य व देशपातळीवरील राजकारणातील सहभाग खरोखर चिंताजनक आहे. देशपातळी-वरील समस्या, गुंतागुंतीचा व्यवहार, सौदे-बाजीचा व्यवहार, शक्तीचा टकरावांचा किंवा मेळ घालण्याचा तिथे स्त्री कशी टिकणार?

कशी यशस्वी होणार? अशा राजकीय भाषेचा वापर समाजात सरसकट केला जातो. या देशात आर्थिक व राजकीय व्यवस्थेच्या नाड्या परंपरेपासूनच पुरुषप्रधान व्यवस्थेकडे असून सुद्धा विधिमंडळ व संसदेतील महिलांची संख्या हाताच्या बोटावर मोजण्याइतपत राहिली आहे. महिला सबलीकरण, स्त्रियांच्या प्रतिष्ठेची भाषा करणारे राजकीय पक्ष, राज्य आणि देशपातळी-वरील निवडणुकांमध्ये स्त्रियांना प्रतिनिधित्व देतांना उघड उघड हात आखडता घेतात. देशाची सर्वोच्च संस्था असलेल्या संसदेमध्ये महिलांचा ३३ टक्के आरक्षणाचा लढा अजून संपलेला नाही ही वस्तुस्थिती आहे समतेसाठी व्यक्तिगत संधी आणि निर्णय स्वातंत्र्य ही महिलांच्या विकासाची साधने आहेत. परंतु वर्षानुवर्षांपासून याच महत्वाच्या साधनांपासून स्त्रियांना जाणीवपूर्वक लांब ठेवण्यात आले. 'बौद्धिक श्रम करण्यात स्त्रिया कोणत्याच बाबतीत मागे नाही मात्र त्यांना उच्च पदावर किंवा जबाबदारीच्या जागेवर पुरुषांच्या प्रमाणात फार कमी संधी मिळते'⁸ अशीच परिस्थिती भारतीय राजकारणाची आहे. राजकारणात स्त्रियांपेक्षा पुरुष दिसून येतात कारण स्त्रियांचे राजकारणात काहीच काम नाही, असे मानून तिला त्या पातळीवरील भूमिका नाकारणे हे पारंपारिक पुरुषी मानसिकतेचे दर्शन आहे. आज स्त्री आणि पुरुष विषमतेच्या निर्देशांका-मध्ये जगात भारताचा 148 पैकी 138 व क्रमांक लागतो निवडणुकीच्या राजकारणाचे सार्वजनिक क्षेत्र हे बाहुबल गुन्हेगारी आणि अवैध मार्गाने व्यापलेले आहे. ते स्त्रियांसाठी सुरक्षित नाही म्हणून त्यातून स्त्रियांना दूर ठेवावे लागते. अशी बोलणारे काही मातब्बर राजकीय मंडळीची संख्या या देशात कमी नाही. आजपर्यंत च्या सार्वत्रिक निवडणुकांमधून स्त्रियांच्या प्रतिनिधित्वाच्या चर्चा झाल्या, परंतु राजकीय सक्षमीकरणासाठी आवश्यक अशी ठोस पाऊले उचलली गेली नाही. त्यामुळेच आजवर प्रमुख राजकीय

पक्षांनी स्त्रीयांना नगण्य प्रमाणात उमेदवारी दिली. स्त्रियांच्या राजकीय आरक्षणाचे यश देखील बऱ्याच अंशी राजकीय पक्षांच्या इच्छाशक्तीवरच अवलंबून होते व आहे.⁹ यावरून राजकारणावर असलेला पुरुष प्रधानतेचा प्रभाव लक्षात येतो.

सामाजिक परिस्थिती :

राजकारणात सक्रिय होण्यासाठी आवश्यक असलेल्या सामाजिक व कौटुंबिक परिस्थितीमध्ये आजही बदल झालेला दिसत नाही. याला अपवाद राजकीय घराणे आहेत. या घराण्यातून येणाऱ्या महिलांना पूर्ण पाठिंबा मिळतो. सुप्रिया सुळे, प्रणिती शिंदे, प्रियांका गांधी या स्त्रिया घराणे शाहीच्या उत्तम उदाहरणे आहेत. इतर परिस्थितीमध्ये मात्र चित्र वेगळे आहे. 'स्त्रिया आणि राजकारण ह्यांच्या परस्पर संबधाचा विचार करत असताना केवळ राजकीय व्यवस्थेमध्ये स्त्रियांचे स्थान काय राहिले किंवा त्यात स्त्रिया कितपत प्रभावी ठरल्या आहेत. इतका मर्यादित परिप्रेक्ष ठेवून चालणार नाही त्यांच्या बरोबर ह्या अन्यायकारक वर्गभेद, जात, जमात, लिंगाधारीत भेदभावावर आधारित श्रेणीबद्ध व्यवस्थेला आव्हान देणे सुद्धा एक प्रकारचे राजकारणच आहे.'¹⁰ भारतीय संविधानात महिलांच्या सर्वांगीण विकासासाठी विविध कलमान्वये समानता प्रस्थापित करण्याच्या तरतुदींचा समावेश केला आहे. ज्यामध्ये कलम १४ अन्वये जात, धर्म, लिंग, आणि वंश या आधारावर कोणताही भेदभाव करता येणार नाही. असा स्पष्ट उल्लेख करण्यात आला असतांना सुद्धा स्त्रियांच्या बाबतीत सर्व प्रकारच्या विषमता समाजात पक्क्या होताना दिसतात. प्रत्यक्षात धर्म, जात, वर्ग वर्ण यांच्यातून जितके तुकडे होतील तितके आजच्या राजकारणाला हवेच आहे. निवडणूक लढविताना होणारे अर्थकारण खर्चातील आकडे विस्मयकारक असतात. निवडणुकीतील उमेदवारीसाठी स्पर्धा,

जिकण्याचे निकष व त्यातील प्राधान्यक्रम हे बदलेले आहे. त्या स्तरावर किती स्त्रिया टिकू शकतात हा खरा प्रश्न आहे. राजकीय गटातटाच्या व दबावतंत्राच्या राजकारणात उतरणे स्त्रियांसाठी कसोटी असते, कारण सामाजिक दृष्ट्या गटातटाच्या राजकारनाचा अनुभव हा फारसा चांगला नसतो. आणि त्यामुळे बहुतांश स्त्रीया राजकारणाकडे नकारात्मक दृष्टीकोनातून बघतात. कारण राजकारणाचा घसरलेला दर्जा व बदललेला राजकीय पोत स्त्रियांच्या पचनी पडण्यासारखा नाही.

• जातीव्यवस्था आणि लिंगभाव :

२१ व्या शतकातील जातिव्यवस्थेचा प्रश्न हा संपूर्ण लोकशाही समाजाची कसोटी पाहणारा प्रश्न आहे. डॉ. आंबेडकरांच्या मते, 'स्त्री ही जातीव्यवस्थेचे दार आहे' आणि हे विधान सगळ्याच भेदभाव करणा-या राजकारणाच्या मुळाशी असलेले सत्य म्हणूनही पाहता येते. आपली स्त्री आणि दुस-यांची स्त्री अशा राजकारणातून स्त्रीयांना एका समुदायाचे मानक बनविणे किंवा त्यांचे वर्चस्व प्रस्थापित करण्यासाठी दुस-या समुदायातील स्त्रियांची विटंबना करणे हे घडताना दिसते'^{११} जाति व्यवस्थेमुळेच लिंगभेदासारखे प्रश्न निर्माण होतात व यामधून विषम वितरणाच्या व्यवस्था पक्क्या होतात. २००६ मध्ये घडवून आणलेले खैरलांजी प्रकरण हे जात आणि लिंगभावाचे ज्वलंत उदाहरण आहे. स्थानिक स्वराज्य संस्थामधून स्त्रियांना राजकारणात आपले स्थान टिकवून ठेवण्यासाठी पुरुषप्रधान व जातीप्रधान या दोन्ही व्यवस्थेसोबत लढा द्यावा लागतो. त्यातही दलित, गरीब, आदिवासी, भटके, अल्पसंख्यांक इत्यादी परीघावर असणाऱ्या स्त्रियांचे विदारक अनुभव आहे. स्त्रीयांना खुर्चीवर बासू न देणे, दलित असेल तर पाणी वेगळे ठेवणे, स्वातंत्र्य दिनी तिच्या हस्ते होणा-या झेंडावंदन कार्यक्रमावर बहिष्कार

घालणे, बैठकीचा निरोप न पाठविणे, घेतलेल्या निर्णयावर शिक्कामोर्तब करण्यासाठी नोंदवही घरी पाठविणे, आणि निवडून आलेल्या स्त्री ऐवजी तिच्या घरातील पुरुष पुढा-याने उघड उघड कारभार करणे हे सुरवातीला जसे झाले तसे आजही कमी जास्त प्रमाणात चालू आहे.^{१२} संसदेतील ३३ टक्के आरक्षणाचा प्रश्न हा जातीय व लिंगभावाचा प्रश्न आहे. तेव्हा राजकारण स्थानिक असो किंवा देश असो पातळीवरील, जात व लिंगभावावर आधारित स्त्रियांचे दुय्यमत्व प्रकर्षाने दिसते.

निष्कर्ष :

१९९० नंतर स्त्रिया राजकारणात आल्या, निर्णयप्रक्रियेला समजून घेऊ लागल्या. परंतु स्त्रियांना निर्णय घेता येतात ती अधिकार गाजवू शकते ही वस्तुस्थिती समाजाने आत्मसात केलेली नाही. राजकारणातील महिलांच्या सक्रिय सहभागाचे चित्र नक्की वेगळे असेल असा विश्वास गेल्या काही वर्षांपासून दिसून येत आहे. ७२ व्या आणि ७३ व्या घटना दुरुस्तीने स्त्रियांसाठी एक प्रचंड सामाजिक व राजकीय अवकाश निर्माण केला आहे. स्थानिक स्वराज्य संस्थामधील आरक्षणा-मुळे शहरी व ग्रामीण भागातील महिलांचा राजकीय सहभाग वाढला पण ज्या संस्थामध्ये स्त्री जीवनावर परिणाम करणारे कायदे तयार केले जातात. तिथे मात्र तिचा सहभाग अल्प आहे. स्त्रियांच्या राजकीय सहभागाचे दुय्यमत्व लोकशाही पुढील फार मोठे आव्हान ठरू शकते. राजकीय प्रक्रियेत महिलांचा समान पातळीवरील सहभाग असल्या शिवाय लोकशाही समृद्ध होऊ शकत नाही. लोकशाही प्रक्रिया ही तेव्हाच परिणामकारक होऊ शकते जेव्हा तिथे सर्व प्रकारच्या विषमता नष्ट होऊन समान पातळीवरील स्त्रीपुरुष सहभाग वाढीस लागेल. समता, शाश्वत विकास, शांती निर्माण करण्यासाठी स्त्रियांचा राजकारणात सक्रीय सहभाग अत्यंत महत्त्वाचा आहे. आणि केवळ

राजकीयच प्रश्न सोडविण्यासाठी सहभाग महत्वाचा नाही तर आर्थिक, सामाजिक, शैक्षणिक, सांस्कृतिक, न्यायालयीन प्रश्न मार्गी लागण्याठी स्त्रियांचा राजकीय सहभाग वाढणे ही काळाची गरज आहे. पण पुरुषप्रधान संस्कृतीत महिलांना पुढे येण्यासाठी कराव्या लागणाऱ्या संघर्षात त्यांची मोठी शक्ती खर्च होते. राजकारणातील पुरुषप्रधानता, जाती व्यवस्था व लिंग भेदासारखे प्रश्न स्त्रियांच्या सार्वजनिक जीवनावर परिणाम करतात. यामधून स्त्रिया केवळ राजकारण नव्हे तर सामाजिक आर्थिक, धार्मिक, सांस्कृतिक, व्यवस्थेतील विषम वितरण व्यवस्थेच्या बळी होतात. या व्यवस्थेमधील निर्णय, हक्क, संधी, स्वातंत्र्य, जबाबदारी, कर्तव्य, उत्पन्न इत्यादीच्या विषम परिस्थिती मध्ये असतात. संसदेतील 1952 ते 2014 पर्यंतच्या लोकसभेतील स्त्री सहभागाची आकडेवारी पाहता असे लक्षात येते की, स्त्रीपुरुष असमानतेचे सर्वात मोठे क्षेत्र संसदेने व्यापले आहे. स्त्रियांच्या आयुष्यावर परिणाम करणारे कायदे ज्या संसदेत निर्माण होतात तिथेच स्त्रियांचे अत्यल्प प्रमाण आहे. याशिवाय ती सर्वच क्षेत्रातील निर्णय क्षमतेच्या शेवटच्या टोकावर आहे हे सत्य नाकारून चालणार नाही. या सर्व चर्चेच्या विश्लेषणावरून हे सिद्ध होते की, स्त्री पुरुष असमानते मधून उत्पन्न होणा-या विषम व्यवस्थे मध्ये स्त्रिया राजकीय पटलावर सक्रीय होताना दिसत नाही. परिणामी स्त्रिया राजकीय दृष्ट्या सत्ताहीन होताना दिसतात.

उपाययोजना :

स्त्रियांचा राजकीय विकास होणे ही काळाची गरज आहे हे मान्य करावेच लागेल. स्त्रियांना राजकीय सक्षम करुणच आपण समाज व राष्ट्र शक्तीशाली करू शकतो. स्त्रियांचा राजकीय सहभाग, त्यांना संरक्षण, आर्थिक उन्नती, त्यांच्या क्षमतांचे संवर्धन या सर्वांसाठी अनुकूल वातावरण निर्माण करेल.

तेव्हा शासन, समाज, कुटुंब इत्यादींनी स्त्रियांप्रती उच्च कोटीची सकारात्मक मानसिकता ठेवणे आवश्यक आहे. जातीव्यवस्था कायम ठेवून समतेवर आधारित समाज उभा करणे शक्य नाही त्यासाठी समाजातील सर्वच जाती धर्मातील लोकांनी स्त्रियांचा दर्जा, हक्क, अधिकार, स्वातंत्र्य, समता, न्याय इत्यादी बाबत जागृती होणे गरजेचे आहे. स्त्रियांप्रती रूढी प्रथेवर आधारित असलेली मानसिकता बदलणे गरजेचे आहे. स्त्रीपुरुष समतेच्या स्थापने साठी डॉ. आंबेडकर यांनी दिलेले संवैधानिक मुल्ये जबाबदारपणाने उपयोगात आणणे समाज व शासन कर्त्यांचे कर्तव्य आहे. गुणवत्तापूर्ण शिक्षण, स्त्रियांच्या हक्क व अधिकाराचे रक्षण करणारे कायदे, शासकीय योजना, उपक्रम इत्यादी प्रयत्न सर्व स्तरावर होणे गरजेचे आहे. त्याचबरोबर रूढी, प्रथा व परंपरेच्या बंदिस्त भिंती तोडून स्त्रियांनी सुद्धा आपल्या हक्क व अधिकाराप्रती जागरूक असणे गरजेचे आहे. कारण 'विषमतेवर आधारलेली कोणतीही व्यवस्था कायम ठेवण्यात त्यातलं शोषितांचा सहभाग हा गरजेचा असतोच'¹³ तेव्हा स्त्रियांनी असुरक्षितता, परावलंबन, अशा नकारात्मक भावना न ठेवता अन्यायाला विरोध, प्रतिकार, स्वयंपूर्णता, स्वावलंबन याची जोपासना करायला हवी. कुटुंब पातळी पासून तर देश पातळी वरील महिलांच्या सामुहिक प्रयत्नांमधून राजकीय बदल घडवून आणणे शक्य आहे. या देशाची कायदे बनविणारी संसद स्त्रियांच्या समान सहभागा शिवाय पूर्ण होऊ शकत नाही. तेव्हा स्त्रियांनी या दिशेने विचार करणे गरजेचे आहे. आंतरराष्ट्रीय महिला दिवस, मातृ दिवस, व महिला संबंधित सण, उत्सव साजरे करून स्त्रियांचे प्रश्न संपणार नाही. तर पंचायत स्तरापासून तर देशपातळीवरील स्त्रियांचा राजकीय सहभाग वाढीस लागणारे पोषक, सर्वसमावेशक वातावरण निर्मिती होणे गरजेचे

आहे. राजकीय सत्तेत सहभागी होऊन संबंध स्त्री जातीच्या सर्वांगीण विकासाचे कायदे करण्याचा सकारात्मक विचार करणे स्त्री विकासाच्या मार्गातील आणखी पुढचे पाऊल ठरू शकेल.

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भारतातील वृद्धांच्या विविध समस्या आणि उपाययोजना

मिलिंदकुमार खेळकर

सहाय्यक प्राध्यापक, समाजशास्त्र विभाग, डॉ. आंबेडकर कॉलेज, दीक्षाभूमी, नागपूर.

सारांश

आधुनिक काळात आपल्या समाजात ज्या विविध प्रकारच्या समस्या जन्मास आल्यात त्या पैकी एक समस्या म्हणजे वृद्धांच्या समस्या होय. राहणीमानात झालेली सुधारणा, वैध्याकीय संशोधन व सुविधा या मुळे विविध आजारांवर मात करण्यात येणारे यश यामुळे माणसाची आयुर्मर्यादा वाढलेली आहे. त्यामुळे देशाच्या लोकासंख्येत वृद्धांची संख्या वाढली आहे. संयुक्त कुटुंब पद्धतीचे विघटन आणि विभक्त कुटुंब पद्धतीचे प्रचलन, घरातील तरुण मंडळींचे नोकरी-काम-धंद्या निमित्त घराबाहेर किंवा देशाबाहेर वास्तव्य असणे, घरातील कमावत्या व्यक्तीची असणारी तुटपुंजी मिळकत इ. अनेक कारणांमुळे समाजात वृद्धांच्या विविध समस्या निर्माण झाल्या आहेत. समाजसेवक, वेगवेगळ्या अशासकीय संस्था आणि सरकार यांचे द्वारे वृद्धांच्या समस्या सोडविण्याचा प्रयत्न केला जातो आहे.



सदर शोधनिबंधाद्वारे वृद्धांच्या समस्या आणि त्या सोडविण्यासाठीच्या उपाययोजनायांची विस्तृत चर्चा करण्यात येत आहे.

प्रस्तावना

भारतात संयुक्त कुटुंबाच्या विघटनातून उद्भवलेल्या विविध समस्यांपैकी वृद्धांची समस्या ही एक समस्या आहे. भारताच्या संदर्भात हि समस्या 19 व्या शतकातील नसून 20 व्या शतकातील आहे. हि समस्या भारतात जाणवण्या आधी अमेरिका, इंग्लंड, फ्रांस, रशिया, यासारख्या देशांमध्ये अस्तित्वात आली. त्या राष्ट्रांमध्ये वृद्धाश्रम, वृद्धांना पेन्शन, वृद्धसाहायता इत्यादी कार्यक्रम कार्यान्वित केले जात आहेत. वर्तमान काळात वृद्धांची समस्या भारतासह सर्वच राष्ट्रांत दिसून येते. तिला जागतिक समस्येचे स्वरूप प्राप्त झाले आहे. भारतात वृद्धांच्या सामस्येने गंभीर रूप धारण केले आहे. त्यामुळे या समस्येचे भारतातील स्वरूप अभ्यासने, हि समस्या सोडविण्यासाठी शासकीय आणि अशासकीय स्तरावर होणारे प्रयत्न याचा उहापोह या संशोधन निबंधात करण्यात येणार आहे.

संशोधनाची उद्दिष्ट्ये

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संशोधन पद्धती/ स्रोत

प्रस्तुत शोध निबंधामध्ये दुय्यम स्तोतांचा वापर करण्यात आला असून त्यामध्ये प्रकाशित अप्रकाशित लिखाण , संदर्भ ग्रंथ , नियतकालिके , साप्ताहिके यांचा वापर करण्यात आला आहे.

'वृद्ध' या शब्दाचा अर्थ

वाढीच्या व विकासाच्या दृष्टीने माणसाच्या आयुष्याचे चारभाग पाडता येतात. बालपण, तारुण्य (तरुण वय), प्रौढत्व (प्रौढ वय) व वृद्धावस्था (म्हातारपण). त्यातील वृद्धावस्था हा प्राण्याच्या व माणसाच्या आयुष्याच्या प्रौढत्वानंतरचा शेवटचा कालावधी आहे. आयुष्याच्या साधारण पासष्टाव्या वर्षापासून मृत्यूपर्यंतचा (६५ वर्षे ते मृत्यू) कालखंड हा वृद्धावस्थेचा असतो. शरीराच्या इतर अवस्थांप्रमाणेच वृद्धावस्थेची सुरुवात होण्याचे वय स्थळ काळ व सामाजिक परिस्थिती यांनुसार बदलते. या काळात त्वचेवर सुरकुत्या पडतात, शरीरातील विविध संस्था नीट काम करू शकत नाहीत. शरीर रोग व आजार यांना बळी पडण्याची शक्यता अधिक असते. या अवस्थेनंतर व्यक्तीला मृत्यू येतो.

वृद्धत्वाच्या व्याख्या -

एलीझाबेत हर्लोक - वृद्धावस्था जीवनातील शेवटचा मावळणारा कालखंड होय .

हेन्नी आणि क्युमिंग - जीवनातील महत्वपूर्ण तसेच पूर्णपणे उपयोगी आणि ज्याविषयी अभिलाषा असते अशा आरंभीच्या काळापासून दूर जाण्याच्या प्रक्रियेला वृद्धावस्था म्हणतात.

वृद्धापकाळाच्या () शास्त्रानुसार, मानवी जीवनाचा शेवटचा कालखंड म्हणजे वृद्धावस्था होय.

जागतिक आरोग्य संघटनेने (WHO) 60 ते 74 वर्षे वयोगटातील व्यक्तींना वृद्ध म्हटले आहे. १९८० मध्ये, संयुक्त राष्ट्र संघटनेने ६० वर्षांवरील लोकांना वृद्ध म्हणण्यासोबतच वृद्धांची खालील तीन श्रेणी मध्ये विभागणी करण्याची शिफारस केली होती.

१. तरुण वृद्ध - वय ६० ते ७५ वर्षे
२. वृद्ध वृद्ध - वय ७५ ते ८५
३. खूप वृद्ध - वय ८५ पेक्षा अधिक

जागतिक लोकसंख्या डाटा शीट -२००२ मध्ये ६५ वर्षांवरील व्यक्तीला वृद्ध म्हणावे असे म्हटले आहे.

भारतात निवृत्तीचे वय ६० वर्षे असल्याने ६० वर्षांवरील लोकांना वृद्ध मानले जाते.

भारतात खालीलप्रमाणे तीन श्रेणी मध्ये विभागणी करण्यात आली आहे.

१. तरुण वृद्ध - वय ६० ते ६९ वर्षे
२. वृद्ध वृद्ध - वय ७० ते ७९ वर्षे

3. खूप वृद्ध – वय ८० ते ८९ वर्षे

थोडक्यात, भारतात निवृत्तीचे वय 60 वर्ष्यांचे असल्याने 60 वर्ष्यांवरील व्यक्तीला वृद्ध म्हणता येईल.

भारतातील वृद्धांची लोकसंख्या

भारतात 1961 मध्ये वृद्धांची लोकसंख्या 2 कोटी 90 लक्ष होती, 1971 मध्ये 3 कोटी 20 लाख , 1981 मध्ये 4 कोटी 40 लाख, 1991 मध्ये 5 कोटी 60 लाख , 2001 मध्ये 8 कोटी 66 लाख तर 2021 मध्ये ती 13.8 कोटींवर पोहोचेल. 2011 मध्ये भारतातील वृद्ध लोकसंख्या 10.38 कोटी होती, ज्यात 5.28 कोटी पुरुष आणि 5.11 कोटी महिलांचा समावेश आहे. 2021 मध्ये ती 13.08 कोटींवर पोहोचेल असे संशोधनकर्ताला वाटते. त्याचबरोबर 2031 मध्ये वृद्धांची संख्या 11.38 कोटीपर्यंत पोहोचण्याचा अंदाज आहे. यामध्ये 9.29 कोटी वृद्ध पुरुष आणि 10.09 कोटी वृद्ध महिलांचा समावेश असेल. वृद्धांच्या संख्येत सतत वाढ होण्याचे मुख्य कारण म्हणजे मृत्यूचे प्रमाण कमी होणे होय.

वृद्धाना भेडसावणाऱ्या विविध समस्या :

शारीरिक समस्या

कोरडे डोळे : अश्रुपिंडाचे काम कमी झाल्यामुळे डोळ्यात पाणी .तयार होण्याचे प्रमाण कमी होत जाते (अश्रू) त्यामुळे डोळे कोरडे झाल्यासारखे वाटतातनेत्र पटलावरील रक्तवाहिन्या फुटल्यामुळे डोळ्यांच्या कार्यात फरक .. प्रतिमा धूसर व अस्पष्ट दिसू लागते .पडतो

मोतीबिंदू (Cataract) : ६५ वर्षानंतर मोतीबिंदूमुळे अंधत्व येण्याचे प्रमाण बरेच असतेकाचबिंदूवर . ढगाळल्यासारखे दिसते यालाच मोतीबिंदू म्हणतात.

वृद्धावस्थेत लोकांना अनेक समस्यांना सामोरे जावे लागतेशरीरातील अनेक अवयव कमजोर झालेले असतात., त्याचबरोबर कुटुंबातील अनेक व्यक्तींची बोलणी खावी लागतातअंधत्व ., दात पडणे, ऐकू कमी ऐने, व्यक्ती ओळखता न येणे अशा अनेक समस्यांना सामोरे जावे लागते.

त्वचा : त्वचेतील कोलाजीन (Cologen)ची लांबी वाढणे आणि त्यामुळे त्वचेची लवचीकता कमी होणेतत्वचेचा . वजन कमी होणे हे पण .न येताततिच्यावरील सुरकुत्या दिसू .मऊपणा कमी होऊन ती खरबरीत लागते .सुरकुत्या पडण्याचे एक कारण आहे

केस : म्हातारपणाची एक खूण म्हणजे केस पांढरे होणे, इतकेच नाही तर ते विरळही होतातत्यामुळे टक्कल . या मागे संप्रेरकांच्यातील बदल कारणीभूत आहे .पडते

हालचाली पूर्वीसारख्या सफाईदार हालचाली होत नाहीत.चालण्यात बदल दिसतो .हालचाली कमी होतात .

दात : दात खराब होणे, पडणे, किडणे, हिरड्यांचे आजार होणे हे चालू होतेनैसर्गिक दात पडून त्या ठिकाणी . तोंडाचे बोळके झाल्यामुळे बोलणे .दात पडल्याने त्यांच्या स्वप्रतिमेवर परिणाम होतो .कवळी लावावी लागते .होत नाही बरेच वेळा स्पष्ट

शरीर : एकूण शरीराला बाक येतोतोल जाऊ नये म्हणून हातकाठ .चालताना तोल जाऊ शकतो .ी वापरावी लागते.

निद्रा : म्हातारपणी झोपेची तक्रार सुरू होते जसे की झोप न लागणे, गाढ झोप न येणे, झोपेतून जागे होणे, परत झोप लवकर न लागणे अशा तक्रारी सुरू होतात असणारे झोप नियंत्रण केंद्रातील रचनेत होणारे मेंदूमध्ये . बदल आणि संप्रेरकांतील बदल

वृद्धांच्या सामाजिक समस्या

(1) आरोग्यविषयक समस्या- शारीरिक, मानसिक आणि भावनिक स्वास्थ्य म्हणजे आरोग्य. वाढत्या वृद्ध त्वा बरोबर शरीराच्या विविध अवयवांची झीज होण्यास सुरुवात होते. त्यामुळे निर्माण होणाऱ्या शारीरिक अशक्तपणाच्या आणि आरोग्याच्या समस्यांचा संबंध दात, हाडे, पोट, हृदय, ऐकू येणे, दृष्टी इत्यादीं संबंधीच्या तक्रारींशी असतो. या शारीरिक तक्रारींच्या बरोबरीने मानसिक समस्याही उद्भवू शकतात. त्यामध्ये कुटुंबातील इतरांपासून तुटल्याची जाणीव, त्यांच्याबरोबर संघर्ष, असमाधानाची जाणीव, वैफल्याच्या भावनेतून आलेले नैराश्य, अस्वस्थता, एकटेपणा इत्यादींचा समावेश असतो. आरोग्यासाठी भावनिक स्वास्थ्यही महत्त्वाचे असते.

(2) एकटेपणाची समस्या - ही समस्या मानसिक आहे असे वाटले तरी तिचा उगम वृद्धांच्या जीवनातील प्रत्यक्ष अनुभवांमध्ये असतो. विशेषतः कोणाचीही सोबत नसणे, मुलेबाळे नसणे, एकट्यानेच वृद्धाश्रमामध्ये किंवा दुर्गम भागात राहणे यांसारख्या गोष्टींमुळे एकटे पडल्याची भावना बळावत जाते. पती किंवा पत्नीचा मृत्यू पूर्वी करत असलेली कामे वयामुळे करता न येणे यांमुळे एकटेपणाच्या भावनेत भर पडते. काही वृद्धांना त्यांच्या स्वतःच्या किंवा मुलांच्या घरातून हाकलून दिल्याच्या घटनाही घडतात. काहींना कुटुंबातील किंवा शेजारपाजारांमधील आपले महत्त्व कमी झाल्यासारखे वाटत राहते.

(3) छळणुकीची समस्या - अनेकदा ज्येष्ठ आणि वयोवृद्ध व्यक्तींना सक्तीने काम करायला लावणे, क्रूरपणे वागवणे, छळ करणे, कुचेष्टचा विषय बनवणे, त्रास देणे यांसारख्या बाबींना त्यांना कुटुंबामध्ये तसेच बाहेरील जगात सामोरे जावे लागते त्यांच्या बाबतीत शारीरिक . छळ आणि घरगुती हिंसेचे अनेक प्रसंग घडत असतात . अनेकदा पैसे, अन्न किंवा कपड्यांसाठी भीक मागणारे वयोवृद्ध पहायला मिळतात.

छळाचे प्रकार

अ) शारीरिक छळ : प्रत्यक्ष मारहाण, ढकलणे, लाथ मारणे, मानसिक खच्चीकरण करणे.

ब) भावनात्मक छळ : मानसिक यातना होतील, मानसिक संतुलन ढळेल असे वर्तन करणे.

क) लैंगिक छळ : अनैतिक संबंधास भाग पाडणे, बलात्कार करणे, अनैतिक स्पर्श करणे.

ड) शोषणात्मक छळ : स्वभावाचा गैरफायदा घेणे, पैशावर, संपत्तीवर कब्जा करणे, परस्पर संपत्तीची विल्हेवाट लावणे.

इ) वृद्धांना निराधार करणे : रस्त्यावर आणणे, घराबाहेर काढणे, वृद्धाश्रमाची वाट दाखविणे.

(4) आर्थिक असुरक्षितता- अनेक वृद्ध व्यक्ती त्यांच्या कुटुंबांवर आर्थिक आधारासाठी अंशतः किंवा पूर्णतः अवलंबून असतात. पितृप्रधान संस्कृतीमध्ये सर्वसाधारणपणे त्यांची जबाबदारी मुलांवर किंवा मुलांवर पडते. दैनंदिन आणि वैद्यकीय गरजा भागवण्यासाठी सर्वच वृद्ध व्यक्तींना निवृत्तीवेतनासारखा स्रोत उपलब्ध असतोच असे नाही. त्यामुळे काही वृद्ध व्यक्ती आर्थिक आधार आणि मदत यांसाठी कुटुंबातील इतर व्यक्तींवर अवलंबून असतात.

(5) सहानुभूतीचा अभाव- व्यस्त वेळापत्रके, जीवनपद्धतीमधील यांत्रिकता, भौतिक सुखांची हाव यामध्ये अडकलेल्या जगात जगणारे लोक बहुतेक वेळा वृद्धांच्या गरजांकडे लक्ष देण्यास उत्सुक नसतात. कुटुंबातील सदस्य किंवा नातेवाईकही सहसा वृद्धांच्या समस्यांवर घरच्या घरीच आपापल्या सोयीने जुजबी उपाय शोधण्याच्या मागे असतात. घरातील तरुण मुले, प्रौढ किंवा काळजी घेणाऱ्या इतर व्यक्तींना वृद्धांच्या समस्या नीटपणे समजून घेता येत नाहीत. वृद्धांना वागवताना त्यांच्याकडून जबरदस्ती केली जाण्याची शक्यता असते.

(6) मानसिक आरोग्याच्या समस्या- यामध्ये अस्वस्थता आणि नैराश्य या समस्यांचे प्रमाण वृद्धांमध्ये अधिक असल्याचे दिसते. या समस्यांच्या बरोबरीने आपण कुटुंब , मित्र आणि नातेवाईकांना भार झालो आहोत, अशी अपराधी भावनाही अनेकांमध्ये बळावलेली दिसते. मात्र आता या समस्यांमधून बाहेर पडण्यासाठी मानसोपचार घेण्याबद्दलचे गैरसमज कमी होत असून त्याबद्दलचा नकारात्मक दृष्टिकोन बदलत आहे.

(7) आरोग्यसेवांच्या उपलब्धतेचा अभाव- अनेकदा शारीरिक किंवा मानसिक आजारांच्या उपचारासाठी उपलब्ध असलेल्या आरोग्यसेवांचा लाभ घेणे वयोवृद्ध व्यक्तींना शक्य होत नाही. विशेषतः वृद्धांमध्ये आढळणाऱ्या कंपवात (Parkinson's) स्मृतीभ्रंश (Alzheimer's), अनियमित मलत्याग (Irritable Bowel Syndrome), मूत्राशयाच्या स्नायूंची शिथिलता (Incontinence) अकार्यक्षमता यांसारख्या शारीरिक आणि मनोविदलता (Schizophrenia), द्विध्रुवीय मनोविकार (Bipolarity), पराकोटीच्या वैफल्यतून आलेले नैराश्य (Depression), कंटाळा, आदरास पात्र नसल्याची भावना यांसारख्या मानसिक आरोग्याच्या समस्यांच्या उपचारासाठी पुरेशा सुविधांचा अभाव असतो. तसेच जिथे या सुविधा उपलब्ध आहेत तिथे जाऊन त्यांचा लाभ घेणे अनेक वृद्धांना शक्य होत नाही.

(8) वृद्धाश्रमांची अपुरी संख्या - देशातील वृद्धाश्रमांची संख्या खेदजनक वाटावी इतकी अपुरी आहे. जे थोडेफार वृद्धाश्रम आहेत ते समाजातील अनेक गरीबांना परवडण्याजोगे नाहीत. जे वृद्धाश्रम चालवले जातात त्यांमध्ये आवश्यक सोयीसुविधांचा अभाव असल्याचे आढळते, तसेच वृद्धांची काळजी घेताना त्यामध्ये आपुलकीचा अभाव असतो. या गोष्टींमागे असलेली व्यापारी वृत्ती आणि हाव दृष्टिआड करता येणार नाही.

(9) दुर्बल घटक - भारतीय समाजातील दुर्बल घटकांमधील वयोवृद्ध व्यक्तींची परिस्थिती तर अधिकच वाईट आहे. यांमध्ये स्त्रिया, समलैंगिक, उभयलैंगिक, तृतीयपंथी आणि अपंग व्यक्तींचा समावेश होतो. एकटी राहणारी स्त्री, शारीरिक, मानसिक आणि भावनिक दृष्ट्या सक्षम नसलेल्या व्यक्तींच्या बाबतीत अनेकदा सेवाशुश्रूषा करण्यास मनुष्यबळ उपलब्ध नसते

(10) शोषण विषयक समस्या - व्यक्तिगत स्वच्छता राखणे, बँक आणि कायदेशीर व्यवहार यांच्या दस्तावेजांवर सही करणे यांसारख्या गोष्टींसाठी दुसऱ्यांवर अवलंबून असणाऱ्या वयोवृद्ध व्यक्ती अनेकदा शोषणाला बळी पडण्याची शक्यता असते.

ज्येष्ठ नागरिक/वयोवृद्ध यांच्या समस्यांवरील उपाययोजना

(1) सरकारची भूमिका- वृद्धांच्या देखभालीसाठी धोरण आखणे आणि त्याची अंमलबजावणी करणे ही केंद्र सरकारच्या अखत्यारीतील 'सामाजिक न्याय आणि मनुष्यबळ विकास' खात्याची जबाबदारी असते. ही जबाबदारी राज्य सरकारे, सेवाभावी संस्था आणि नागरी समाज यांच्या साहाय्याने पार पाडली जाते.

(2) सरकारी धोरणे - जानेवारी 1999 मध्ये वृद्ध व्यक्तींच्या स्वास्थाची काळजी घेण्यासाठी राष्ट्रीय धोरण जाहीर करण्यात आले. वृद्ध व्यक्तींना आश्रय देणाऱ्या वृद्धाश्रमांची निर्मिती करणे, वृद्धांना आधार देणे, वृद्धांच्या समस्यांबाबत समाजामध्ये जागृती करणे, आरोग्यकेंद्रांमधून वृद्धांसाठी आवश्यक असणाऱ्या सेवा-सुविधा पुरवणे, असुरक्षित घटकांच्या सुरक्षिततेची व्यवस्था करणे वगैरे गोष्टींसाठी राज्यसरकारांकडून मिळणारे सहकार्य या धोरणामध्ये गृहीत धरलेले आहे.

(3) अंमलबजावणीची योजना - वृद्धांसाठी जाहीर केलेल्या योजनेची प्रभावी अंमलबजावणी होण्यासाठी असलेली यंत्रणा मंत्रिमंडळातील विविध मंत्र्यांच्या नियंत्रणाखाली असलेल्या खात्यांच्या एका समन्वयित समितीद्वारे राबवली जाते.

(4) सेवाभावी संस्थांची भूमिका - भारतातील बिगरसरकारी सेवाभावी संस्थांनी वृद्धांच्या साहाय्यासाठी मोलाची कामगिरी बजावली आहे. उदाहरणार्थ, 'हेल्पएज इंडिया', 'हार्मनी इंडिया', 'दादा दादी', 'डिग्नटी फाउंडेशन', 'नाईटिंगेल्स मेडिकल ट्रस्ट', 'सीनेजरर्स' इत्यादी. आता या कामाला बळ देण्यासाठी आंतरजालाद्वारे काम करणारे गट स्थापन झालेले आहेत.

(5) शिक्षणव्यवस्थेची भूमिका - सामूहिक सेवाप्रकल्पांच्या माध्यमातून (कम्युनिटी सर्व्हिस प्रोजेक्ट्स) किंवा संपर्कयोजनांद्वारे (आऊटरिच प्रोग्रॅम्स) किंवा सामाजिकदृष्ट्या उपयुक्त उत्पादनाच्या कार्यातून (सोशली युजफुल प्रॉडक्टिव्ह वर्क) आणि एन.एस्.एस्. द्वारे शाळांना ज्येष्ठ नागरिक, वयोवृद्ध यांच्यासमस्यांच्या बाबतीत प्रबोधनाचे कार्य करता येणे शक्य आहे. असे कार्यक्रम राबवल्यामुळे वृद्धांच्या शारीरिक, भावनिक, आर्थिक, मानसिक आणि वैद्यकीय गरजांबद्दल समाजात जागृती निर्माण होईल आणि समाजामध्ये त्याबद्दलची योग्य मूल्ये रुजू शकतील.

(6) कुटुंबाची भूमिका - कुटुंबातील सर्वच सदस्य नातेवाईकांनी कुटुंबात पोषक वातावरण ठेवण्याचा प्रयत्न केला पाहिजे. कुटुंबातील ज्येष्ठ व्यक्तींकडे असणाऱ्या अनुभवाचा व जाणतेपणाचा आदर केला पाहिजे. त्यांना घर, शेजारपजार आणि समाजामध्ये घडणाऱ्या गोष्टींमध्ये सामावून घेतले जावे असे वातावरण निर्माण करण्यामध्ये महत्त्वाची भूमिका बजावली पाहिजे.

निष्कर्ष

भारतात वृद्धांच्या समस्येने गंभीर रूप धारण केलेले आहे. पूर्वीचे एकत्र कुटुंब जाऊन आईवडील व लहान मुले एकत्र राहत असलेले एककेंद्री वा एकेरी कुटुंब अस्तित्वात आले. वृद्ध माणसे अशा कुटुंबात तरुण नातलगांपासून व एकमेकांपासून तुटत व अलग पडत गेल्याचे दिसून येते. कौटुंबिक नातेसंबंधातील अशा बदलांचे दुष्परिणाम वृद्धांना भोगावे लागतात. पूर्वीच्या एकत्रित कुटुंबात वृद्धांना लाभणारा आदर व अधिकार कौटुंबिक विघटनामुळे व एककेंद्री कुटुंबपद्धतीमुळे लोप पावत गेला, तसेच कुटुंबप्रमुख म्हणून असलेले वृद्धांचे स्थानही ढळत गेले. कुटुंबातील तरुण व वृद्ध पिढ्यांमध्ये मानसिक दुरावा व विसंवाद यांची खोल दरी निर्माण होत गेल्याने वृद्धांना कित्येकदा गंभीर भावनिक ताणतणावांना तोंड द्यावे लागते. आधुनिक समाजात झपाट्याने होत असलेले नागरीकरण, व्यवसायप्रधान जीवनपद्धती व त्यांतून उद्भवलेली गतिशीलता, तरुण पिढीची व्यवसायाभिमुखता व आधुनिक अर्थव्यवस्थेत त्यांना प्राप्त झालेले महत्त्वपूर्ण स्थान इ. घटकांमुळे आधुनिक उद्योगप्रधान समाजजीवनात वृद्ध पिढीला गौण व दुय्यम स्थान पतकरावे लागते. वाढत्या वयाबरोबर उद्भवणाऱ्या वृद्धांच्या शारीरिक-मानसिक व्याधी व तदनुषंगिक समस्या यांत लक्षणीय वाढ झाली असून, त्यांची उग्रता व गांभीर्य भेडसावणारे आहे. तसेच कौटुंबिक आधार गमावलेल्या वृद्धांच्या निवारण्याचा प्रश्नही बिकट झाला आहे.

तरीपण कुटुंब, समाज, स्वयंसेवी संस्था आणि सरकार या घटकांच्या माध्यमातून वृद्धांच्या समस्या सोडविणे शक्य होऊ शकते.

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SOCIO-ECONOMIC PROBLEMS OF UNORGANIZED DOMESTIC WORKERS IN NAGPUR CITY

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ABSTRACT

Urban life cannot be imagined without domestic workers. The whole family can go out and engage in economic activities only because a domestic worker is responsible for taking care of the household chores. Domestic women workers are one such class of workers, whose exploitation continues even today. To say that even if they are workers, they are considered as maids. Some of them work in several households, some work for a limited time in one household, and some work full-time in one household. These domestic women workers are subjected to various kinds of cruelty, atrocities, and exploitation. Cases of atrocities against women domestic workers keep coming to the fore. But such cases often come to the fore only when there is a big or frightening incident, otherwise, the cries of most of the women workers are left suffocating in the four walls of the brothels. Due to the fear of snatching their livelihood, they are unable to even complain about the violence against them. In this research paper, the socioeconomic problems of the unorganized domestic workers of the unorganized sector in Nagpur city have been studied.



KEYWORDS: Domestic Workers, Female Domestic Workers, Unorganized Sector, Nagpur City, Socio-Economic Problems

INTRODUCTION :

There has also been an increase in the demand and supply of domestic workers, especially women. In the 1931 census, 2.7 million of the country's population was marked as 'domestic workers'. At the same time, in the 1971 census, this number decreased to just 67,000. However, between 1991 and 2001, there was a sudden increase of 120 percent in the number of domestic workers. The

maximum increase was seen in the number of women working outside the home. According to official figures, between 2001 and 2011, the number of women aged 15-59 working as domestic workers in the country increased by 70 percent. In 2001, where the number of female domestic workers in the country was 1.47 crore, in 2011 this number increased to 2.5 crores.

The number of women registered in the Domestic Labor Board in Nagpur district is more

than 1 lakh 14 thousand. Most of these working women are widows, abandoned women, and many other distressed women. These domestic working women can be divided into three categories, first, those who work in multiple households, second those who work for a limited time in a single household, and third those who work full time in a single household. . 35 types of work are edited by these women. The work of domestic women workers is very difficult. Most of

them work in multiple households and have to work continuously from morning to evening to earn a living. Not only this, apart from this, they also have to do their household work.

Firstly, the Domestic Workers (Conditions of Work) Bill was made in 1959, but due to non-implementation, it remained in history. At present, the bill regarding unorganized sector workers (including domestic workers) has been introduced and passed in the year 2004. But scholars say that due to the inadequacy of its provisions, it does not see the possibility of getting any special help to women doing domestic work. The National Commission for Women has sent a draft to the government after consultation with various stakeholders. This law also includes provisions for the regulation of placement agencies and providing social security to women domestic workers, but the process of practical implementation of this law requires more discussion and mutual consultation. The Maharashtra government passed a law in the year 2008 for these women domestic workers. Under this law, considering them as salaried employees, they have also been given the eligibility for paid leave. It has also been talked about making available the facility of loans, health insurance, and provident fund on easy terms. There is also a provision for the establishment of the District Welfare Board for the implementation of these laws.

According to statistics, there are 47.5 lakh domestic workers in the country. Interestingly, only 10 out of 31 states and union territories have made domestic workers part of the schedule of the Minimum Wages Act. The Periodic Labor Force Survey classifies domestic work as "informal". While wages for domestic workers range from Rs 1,000 to Rs 10,000 in rural Nagpur, it ranges from Rs 2,000 to Rs 13,000 in urban Nagpur. In the year 1980, the domestic workers in Pune went on strike and after that, they together formed the Pune City Molkarni Sanghatana. The organization demanded an increase in salary and sick leave. Presently there are many domestic workers' unions in Pune, Nagpur, and Mumbai.

Official figures say that there are lakhs of domestic workers in the country. But according to the 68th round of NSSO-2011-12, about 39 lakh people work as domestic workers in private households, of which 26 lakhs are women. Census figures say that around 1.25 lakh children in the country are forced to work as domestic workers or at dhabas. International Labor Organization after analyzing NSSO and employment and unemployment surveys says that in 2009-10 two-thirds of domestic workers were working in urban areas. Most of them are illiterate or have little education and are also unskilled. They are one of the poorest and most exploited groups in the country. They must depend on their employers as they do not have any legal protection under the labor laws of India.

RESEARCH METHODOLOGY:

The research paper has depended on secondary data.

OBJECTIVE OF RESEARCH:

- 1) To study the social problems of the unorganized domestic workers of the unorganized sector in Nagpur city.
- 2) To study the economic problems of the unorganized domestic workers of the unorganized sector in Nagpur city.
- 3) To study the present status of unorganized domestic workers in the unorganized sector in Nagpur city.

SOCIO-ECONOMIC PROBLEMS OF UNORGANIZED DOMESTIC WORKERS OF UNORGANIZED SECTOR IN NAGPUR CITY:

Domestic work is a far more important source of employment for women workers than for men in Nagpur city. About 81 percent of women in Nagpur city work in this informal sector, which is double the share of any other informal employment. This work is often done by poor and unskilled migrant women from rural districts and marginalized communities. Domestic workers receive fewer wages, and legal or social protection than other workers in various informal sectors in Nagpur city. Very few domestic workers in Nagpur city work on a labor contract basis. They usually have no provision for

maternity leave, access to health care or monetary benefits, period leave, or pension. Today some Acts like the Unorganized Social Security Act 2008 and the Sexual Harassment of Women at Workplace Act 2013 can prove to help protect them but till now there is no comprehensive law for the workers of this sector. It should be noted that for most women their workplace is someone's home. In such a situation, it becomes almost impossible for them to take advantage of this law for sexual harassment. Even before the pandemic in Nagpur city, domestic workers have been facing discrimination and exploitation based on class, caste, etc. In such a situation, there is a need for policy changes to improve and protect their living standards.

Domestic workers in Nagpur city have to work six low-wage jobs to realize the state's minimum wage. Cleaning, food preparation, maintenance, and the time spent performing these tasks determine workers' wages. However, on the downside, skill, reputation, and experience are not given much consideration while fixing the salary. Trustworthiness, hard work, and punctuality are the main aspects of recruitment. Due to the heavy workload of domestic workers, they often fall prey to back pain, tiredness, etc. Some tasks like washing dishes and washing clothes cause wounds in the fingers of the hands of women, yet they have to do the same work. Out of these, only 3 grams of hemoglobin was found in the blood of many women whereas its normal level is 11.5 grams to 15.5 grams. It is difficult for them to get medical treatment even when their health is bad because they do not have time to spend in public hospitals and they cannot afford to pay the cost of private medical care.

In Nagpur city in the past most of the women domestic workers were full time and working with the same family created a social and psychological bond between them and the family taking the work which provided them security in case of adversity. Now, due to working in many houses, she finds work near her residence and wants that there should be a minimum distance between the workplace and her residence. This is the reason why slums are also settled around the middle-class settlements in the city. In the process of beautification of the city, whenever efforts are made to remove them from there and settle them in new houses, they do not like to go there because these settlements are far away from the workplace. Due to unorganized and piecemeal work, the wages they get depend on their bargaining power. This is the reason why there is a lot of disparity in the rates of wages.

The most common reason for hiring domestic workers in Nagpur city is free time for caregiving/emotional tasks. Additionally, "frees up time for paid work/can keep a job" is also one of the most cited reasons. Female domestic workers working in affluent localities get relatively better wages. Due to the increasing number of maidservants, the variety of work, and the huge number of job takers, the task of giving legal protection to them has become necessary in today's circumstances even though it is quite challenging. Women workers have been neglected in our labor laws anyway. This is the reason why these domestic working women have been neglected in all the laws regarding minimum wages, working hours, protection from occupational hazards, etc.

Domestic workers in Nagpur city have no bargaining power due to poverty, illiteracy, and the unskilled. They cannot decide the terms of their work. That is why not even organized. Can the unorganized people think of any kind of strike? There have been many initiatives to make laws and regulations for domestic workers. In this regard, in 2015, BJP MP Kirit Bhai Solanki introduced the Domestic Workers (Excellent Working Conditions) Bill in Parliament. But that bill is still pending. In 2011, the International Labor Organization approved Convention No. 189 to protect domestic workers. India is yet to ratify it. The 2008 Act to provide social security to unorganized laborers in the country and the 2013 Act to prevent sexual harassment at the workplace also do not recognize the rights of domestic workers. Nor has the Child Labor Act of 1986 recognized domestic work as hazardous. The 2015 bill also prohibited the use of children in domestic work. At present, there is no such law at the national level, which sets rules and regulations for domestic workers. However, states such as Maharashtra and Kerala have set up domestic workers' welfare boards.

Women domestic workers in Nagpur city work continuously from morning to evening for livelihood. Due to the heavy workload, their health is badly affected, but they are not able to take leave due to the fear of wages being cut. It also becomes difficult to get treatment in case of ill health, because it takes a long time in government hospitals and more money is spent in private hospitals. There are

lakhs of women domestic workers in the country, but their work is classified as non-productive work. They do not have any fixed wages; it completely depends on the will of the employer.

According to an estimate, the number of domestic workers in the country is between 40 lacks to one crore, and in any civilized society and modern economy, such a large population cannot be kept out of legal protection. The Government of Maharashtra implemented a separate welfare act for domestic workers in the year 2008. Named 'The Maharashtra State Domestic Workers Welfare Board Act, 2008'. The fight of domestic workers is for the right-to-work law. Not only to implement welfare facilities but the nature of this law is to deprive the rights of the workers. This act came in 2008 and the board was established in 2011. Schemes such as scholarship schemes, honorarium schemes, computer schemes, etc. were given through the board; But they were not fully implemented. This board was dissolved in between. This board was not constituted by the government. At present, the Development Officers have been deputed as Single Member Boards for Domestic Workers. Since the inception of the Single Member Board, no new scheme has been launched except Aam Aadmi Bima Yojana for domestic workers. As a result, there was very little registration of domestic workers in the Welfare Board.

Most of the women domestic workers in Nagpur city are from economically and socially backward and underprivileged communities. This social status of theirs also creates opposite situations for them. Sexual harassment, accusations of theft, showering of abuse or denial of use of toilets, etc. inside the house, and untouchability are common with them. The problem is that they do not have any organization to raise their voice against the atrocities on them. Because of this, they are not able to negotiate with the employer regarding wages and facilities. If there is violence against them by the employer or any member of their family, then there is no other forum except the complaint to the police, where they can express their views.

There are more than two crore domestic workers in the state. However, till 2014 only 36 thousand 866 workers were registered. It is unfortunate that the work of the Domestic Workers Welfare Board, established in 2011 in the state, is still only on paper. While the central government is preparing to formulate a national policy for domestic workers, it is being speculated how the sufferings and problems of the laborers are being considered by the registration in the state.

There is a social security law for workers in the unorganized sector in the country, in which domestic workers are also included, but there is no such law at the national level so that their working conditions are better and they get the right wages. Most domestic helpers start working at a very young age and are paid less than the minimum wage prescribed by the government.

Currently, Nagpur city has the largest number of part-time workers in the country. These workers are domestic workers in closed rooms. Their employment, place of employment, and working hours are not fixed. Mall culture is now increasing the number of such workers. That's why there is a need to change the definition of domestic workers. However, due to the neglect of the government in terms of work and other facilities, the situation remains the same. Abusing, mental, physical, and sexual abuse is common among these women working as domestic help.

At present, 17 thousand 55 domestic workers members have benefited till 31 August 2014 under Janashree Bima Yojana in Nagpur city. 31 children of laborers got the benefit of a scholarship. After the death of a domestic worker, her family was given Rs 30,000. There were ten applications for maternity assistance. Out of these, only four people got the help of five thousand each. Nagpur is the sub-capital of the state. Despite this, Nagpur city is lagging far behind in the strict implementation of the scheme. Due to being poor, illiterate, and unskilled, they do not have much information. The government should bring a law for these laborers as soon as possible and enforce their working hours, salary, and right to organize.

CONCLUSION:

First, initiatives will have to be taken to include domestic workers among working women. The government has announced bringing a bill for domestic workers. If domestic workers get the status of workers, they will be able to lead a dignified life. Laws have been made for them in some states, but this has not happened across the country. Apart from this, the real fight is with the feudal mindset, without

ending discrimination and oppression cannot be removed. Mainly the apathetic attitude of the state has been held responsible for the plight of domestic workers. It is because of this indifference that the owners get a free hand to use almost judicial power. This type of dictatorial power was given to the owners in the early colonial period by the British as a quasi-punitive authority, in which the owners had full right to determine the work and to force the workers to quit or re-employ the labor relationship. The attempt was declared a criminal act. Undoubtedly, continuous non-payment of wages for several months and restrictions on leaving work make domestic work akin to a form of bonded labor. Therefore, serious efforts should be made to bring domestic workers under the ambit of social security.

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ORIGINAL ARTICLE

**Localization Studies of Proteins in Hypothalamo-Hypophysial Axis in
Garra mullya (Sykes)**

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Abstract

Like all other biological components, proteins undergo continual turnover, which may significantly affect an organism's ability to respond quickly to environmental changes. Of course, protein turnover is influenced by the rate of protein synthesis and degradation, which are both controlled separately. Fish that consume higher protein diets retain more protein, and it has been theorised that some of the energy from the proteins' digestion is instead used to fuel the growth of somatic and gonad tissues. During the pre-spawning stage, the pituitary gland and forebrain display prominent protein staining. The intensity of bromophenol blue staining is also moderate histochemically during the spawning phase of the pituitary gland. The steroids that the ovaries of the *G. mullya* produced are thought to have had a favorable influence on the rise in proteins in the forebrain during the pre-spawning stage. The reduced protein concentration in the forebrain during spawning may be caused by the release of ovarian hormones. The complete hypothalamo-hypophysial axis is proven to contribute to the growth of the gonads when proteins are shown histochemically.

Keywords : hypothalamus, pituitary, histochemical localization, *Garra mullya*

INTRODUCTION

The majority of fish species reproduce seasonally, and gonadal maturation occurs when conditions are ideal for offspring survival (Hoar, 1969). Fish species have a wide range of reproductive methods that are multiple adaptations to a wide range of aquatic conditions. This variation may relate to aspects of gametogenesis such as the length of vitellogenesis and egg morphology as well as sexuality, spawning, parental behaviour, sensitivity to environmental influences, and sexuality (Jalabert, 2005). To produce fertilizable gametes (i.e., eggs and sperm) required for successful reproduction as well as the pituitary-dependent synthesis and secretion of a variety of steroid hormones which regulate the development of germ cells are the basic complementary functions of the gonads in teleosts, similar to those of higher vertebrates (Nagahama, 1982). The regulation of reproduction is greatly influenced by a variety of extrinsic variables in addition to neuro-hormonal regulation. The tropics' freshwater habitat is significantly altered by the rainy season due to changes in the pH and level of the water, light intensity, temperature, smell, and other factors. Accordingly, environment and photoperiod are said to have an impact on gonadal development, increasing the gonadosomatic-index (GSI). Gonadosomatic-index is a regularly used indicator of reproductive maturity (GSI). Because the size to

which the fish grows and at which it matures varies widely, measurement by size is inaccurate (Lowe-Mc Connell, 1982)..

Hypothalamus is the most important and largest part, located below the thalamus representing ventral most diencephalic region. Anterior part of the hypothalamus contains pre-optic area (POA). Two important nuclei centers are present in the hypothalamus, one is nucleus pre-opticus (NPO) and the other is nucleus lateralis tuberis (NLT). Both have nerve cells of secretory nature. Hypothalamus projects ventrally in a pouch like downgrowth, the infundibulum, tip of which bears hypophysis or pituitary gland. Infundibulum contains hypothalamic and pre-optic nerve fibers involved in neuroendocrine regulatory functions. Hypothalamus plays an important role in regulating the endocrine system through the hypophysis (Savage, 1968).

The hypophysis or pituitary gland is situated below the diencephalon (hypothalamus) just behind the optic-chiasma and anterior to saccus vasculosus. It is an oval body, compressed dorsoventrally. Male pituitary gland is smaller than that of females (Kumar and Tembhare, 1996). The teleostean pituitary is known for its remarkable structural diversity. Studies on fish pituitary glands prove that many physiological functions like growth, reproduction, reproduction related behavior, instinct for identification, regulation of body electrolytes balance and gonad development are controlled by hormones that are released from the pituitary gland, in the same way as it functions in mammals (Val-sella *et al.*, 1977 and Evans, 1998).

In the protoplasm of cells, nitrogenous substances like proteins are the most prevalent solids. Proteins make up about 75 percent of the body's solid matter. The body has 21 amino acids in considerable amounts, which are known as globular proteins and are the main building blocks of proteins. Proteins are kept in a globular shape by coiling and folding of the peptide chains. Proteins are soluble in water or salt solutions. In the body, these proteins carry out many diverse tasks. Certain body tissues take involvement in the storage of amino acids, some more so than others (Guyton, 1976). The constant turnover of proteins, like all other cellular components, may have a substantial impact on an organism's capacity to quickly adapt to environmental changes (Goldberg and Dice, 1974). Of course, the rate of protein synthesis and breakdown, which are both regulated separately, affects protein turnover (Goldberg and Odessey, 1974). Fish that eat higher protein diets retain more protein, and it has been hypothesised that some of the energy from the digested proteins is diverted for somatic and gonad tissue growth instead of being used for maintenance and regular metabolism (Lee and Putman, 1973). Adenohypophysis is glandular in nature and further subdivided into rostral pars distalis (RPD) (proadenohypophysis), proximal pars distalis (PPD) (meso-adenohypophysis) and pars intermedia (PI). This is a widely accepted terminology (Prasadarao *et al.*, 1972; Jose and Sathyanesan, 1980). In the current study, proteins are histochemically shown in the hypothalamus and the pituitary using light microscopy in *G. mullya*.

MATERIALS AND METHODS

This fish is an annual breeder and breeds naturally in running water and is available throughout the year, can be transported and maintained under laboratory conditions easily and better suited for experimental purposes; therefore it was selected for the present study

Histochemical methods:

The fish were given a 0.2% paraldehyde anaesthesia before having their ovaries removed, some of which were then immediately preserved in Carnoy's fixative. Tissues that had been fixed with Bouin's fixative were moved to 70% alcohol, dehydrated there, cleaned in

xylene, and then imbedded in paraffin wax at 580 to 600°C. The tissue was treated for histological studies by being sliced on a microtome at a thickness of 10 m, and the ovary was cut at a thickness of 6 m to 8 m in both transverse and saggital planes. Sections were hydrated in water, deparaffinized in xylene, passed through declining grades of alcohol, stained in Mercury Bromo Phenol Blue, rinsed in 0.5% glacial acetic acid, and then differentiated in tertiary butyl alcohol till blue colour showed. Cleared in xylene and mounted in DPX.

OBSERVATIONS

Presence of proteins in forebrain and pituitary is demonstrated by mercury bromophenol blue (MBPB) method (Mazia et al., 1953). During **resting phase (late October - mid February)**, in the hypothalamus, NPOp shows moderate staining of MBPB (Fig.01). while NLT shows light staining (Fig.06). In the pituitary, PPD cells show light staining (Fig.11). In **preparatory phase (late February - mid April)**, in the hypothalamus, NPOp axons show intense staining of MBPB (Fig.02), while NLT show intense staining (Fig.07). In the pituitary, PPD cells show moderate staining (Fig.12). During **pre-spawning phase (late April - early June)**, in the hypothalamus, NPOp shows intense staining of MBPB (Fig.03). while NLT shows intense staining (Fig.08). In the pituitary, PPD cells show moderate to intense stain (Fig.13). Further during **spawning phase (June – August end)**, in the hypothalamus, NPOp shows intense staining of MBPB (Fig.04). while NLT shows moderate staining (Fig.09). In the pituitary, PPD cells show moderate stain (Fig.14). Lastly during **postspawning phase (September - mid October)**, in the hypothalamus, NPOp shows weak staining of MBPB (Fig.05). NLT shows moderate staining (Fig.10). In the pituitary, PPD cells are intensely stained (Fig.15).

DISCUSSION

Studies on Masu Salmon revealed that sGnRH level in pre-optic area (POA) and the pituitary increase alongside gonadal maturation (Amano *et al.*, 1992) which provide interactions along this axis. sGnRH neurons in the ventral telencephalon (POA) and hypothalamus are essential for gonad maturation in goldfish (Amano *et al.*, 1995) and sbGnRH is also involved in the gonadal maturation in barfin flounder via synthesis of steroid hormones (Amano *et al.*, 2004a, 2008).

Recently, direct connections between telecephalon, hypothalamic region and the pituitary were demonstrated in the electric fish *Apteronotus leptorhynchus* and in the goldfish (Anglade et al, 1993). These data support the hypothesis that sGnRH neurons in the pre-optic area and ventral telencephalon innervate the pituitary and regulate GTH secretion.

In the hypothalamus of fore brain, NPO and NLT are located at the base of pituitary are said to be involved in the regulation of GTH secretion for gonadal recrudescence in *C. batrachus* (Khan *et al.*, 1999; Sarkar and Subhedar, 2001). In the fore brain of *G. mullya*, both NPO and NLT neurons are intensely stained for protein during pre-spawning phase. In the fore brain, quantitative variations match with the histochemical staining where highest protein contents are observed in pre spawning phase. Intensity of staining for proteins becomes moderate in the spawning phase in along with reduction of total protein content. These proteins are elevated in the preparatory phase. Staining intensity becomes light to moderate in this phase.

A correlation between cytological activity in the NLT and/or the NPO and reproductive activity is noted for a number of teleosts (Peter, 1970). NLT is speculated to be a source of GnRH and its destruction alters the GTH secretion leading to the gonadal effects. Among physiological factors, gonadal steroids are one of the probable, candidates for

regulation of GnRH neuronal system in teleosts. There are several reports indicating that sex steroids affects the GnRH system in brain, especially articles on positive feedback in female fish, Sockeye salmon (Okuzawa, 2002) are common. The surge of proteins in hypothalamus during pre-spawning period can be correlated to such positive feedback from sex steroids synthesized by ovary in *G. mullya*. Negative feedback effects of sex steroids on GnRH system are reported in African Cichlids (Francies *et al.*, 1993). It is likely that status of fish, such as its gonadal maturity determines the direction (Negative or Positive) of feed back on sex steroids. Similar situation can be speculated *G.mullya*.

In *G. mullya*, cells in the PPD region of pituitary are intensely stained for proteins and highest protein content is noted in the pre-spawning phase while in spawning gonadotropin secreting cells are moderately stained for proteins. Protein content also decreases. During spawning period, intensity of staining is reduced and there is a drop of protein content in pituitary. Reduction of protein in spawning might be due to the action of dopamine (DA), another neuropeptide, which inhibits the GnRH induced GTH-II response via D2 receptors on gonadotrophs in a various fishes including cyprinids, salmonids, catfish, eel, tilapia (Peter and Yu, 1997). In some of the species, DA also reduces basal GTH-II secretion directly at pituitary cell level. At this time, there is significant rise in gonadal proteins in *G. mullya*. It may either be due to increase in synthetic activity of proteins from pituitary which might have been diverted to gonad in response to spawning activity.

The proximal pars distalis (PPD) where GTH cells are located, receive innervations from neurosecretory fibers in number of fish species, goldfish (Anglade *et al.*,1993) and *L. rohita* (Bhute, 2004). Innervation of pituitary by the fibers from the brain is seen *G. mullya*. Thus, involvement of GnRH in regulation of GTH secretion cannot be ruled out in this fish. It is well known that neurohypophysial peptides may act as chemical messengers delivered to target cells as hormone, neurotransmitter or local paracrine factor (Hazon and Baltment, 1998).

CONCLUSION

The pituitary gland and forebrain exhibit strong protein staining during the pre-spawning phase. In the pituitary gland's spawning phase, the intensity of bromophenol blue staining is also moderate histochemically. It is assumed that the increase in proteins in the forebrain during the pre-spawning stage may have been influenced positively by the steroids that the ovary of the *G. mullya* produced. The release of ovarian hormones may be the cause of the lower protein concentration in the forebrain during spawning. When proteins are shown histochemically, the entire hypothalamo-hypophysial-gonadal axis contributes to the growth of the gonads.

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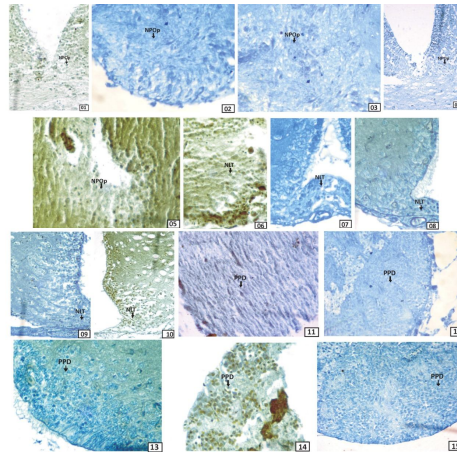


Fig. 01: Transverse section (T.S.) of brain through diencephalon during resting phase showing moderate staining in nucleus preopticus pars parvocellularis (NPOp). **MBPBx400X.** **Fig. 02:** T.S. of brain through diencephalon during preparatory phase showing intense staining in NPOp. **MBPBx400X.** **Fig. 03:** T.S. of brain through diencephalon during pre-spawning phase showing moderate to intense staining in NPOp. **MBPBx400X.** **Fig. 04:** T.S. of brain through diencephalon during spawning phase showing intense staining in NPOp. **MBPBx400X.** **Fig. 05:** T.S. of brain through diencephalon during post-spawning phase showing weak staining in NPOp. **MBPBx400X.** **Fig. 06:** Transverse section (T.S.) of brain through diencephalon during resting phase showing light staining in nucleus lateralis tuberis (NLT). **MBPBx400X.** **Fig. 07:** T.S. of brain through diencephalon during preparatory phase showing moderate to intense staining in NLT. **MBPBx400X.** **Fig. 08:** T.S. of brain through diencephalon during pre-spawning phase showing intense staining in NLT. **MBPBx400X.** **Fig. 09:** T.S. of brain through diencephalon during spawning phase showing moderate staining in NLT. **MBPBx400X.** **Fig. 10:** T.S. of brain through diencephalon during post-spawning phase showing moderate staining in NLT. **MBPBx400X.** **Fig. 11:** Transverse section (T.S.) of pituitary gland during resting phase showing light staining in proximal pars distalis (PPD). **MBPBx400X.** **Fig. 12:** T.S. of pituitary gland during preparatory phase showing moderate staining in proximal pars distalis (PPD). **MBPBx400X.** **Fig. 13:** T.S. of pituitary gland during pre-spawning phase showing moderate to intense staining in proximal pars distalis (PPD). **MBPBx400X.** **Fig. 14:** T.S. of pituitary gland during spawning phase showing moderate staining in proximal pars distalis (PPD). **MBPBx400X.** **Fig. 15:** T.S. of pituitary gland during post-spawning phase showing intense staining in proximal pars distalis (PPD). **MBPBx400X.**



Adsorption of cadmium and lead using weed plant species as low cost adsorbent

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Abstract Adsorption forms are by and large broadly utilized by different specialists for the expulsion of substantial metals from waste streams utilizing activated carbon as an adsorbent. As of late, the requirement for protected and efficient strategies for the exclusion of dense metals from degraded water has required research energy toward the generation of minimal effort options to monetarily accessible activated carbon. In this way, there is a critical need that every possible wellspring of agro-based modest adsorbents should be investigated and their attainability for the expulsion of substantial metals must be examined in detail. In this investigation, the adsorption process of *Cleome viscosa* was examined concerning Cd²⁺ and Pb²⁺ particles. This plant has not gained much significance and is plentiful in the Indian atmosphere. The batch adsorption technique was utilized for ideal pH, contact time, and initial metal concentration. The adsorption procedure pursues pseudo-second-order reaction kinetics, and in addition Langmuir and Freundlich adsorption isotherms. The maximum removal efficiency of 99% for Cd (II) at pH 5, 98% for Pb (II) at pH 6 was observed using *Cl.viscosa*.

Keywords *Cl.viscosa*, adsorption, cadmium, lead, acetic acid, formalin

Introduction

According to the 2018 world organization world development report, “we need new arrangements in overseeing water assets to deal with rising difficulties to water security caused by people development and environmental amendment. In the event that we don't do anything, somewhere in the range of five billion individuals will live in zones with poor access to water by 2050. It is the ideal opportunity for us to re-evaluate nature-based arrangements (NBS) to help accomplish water the executives' destinations. (As cited in Chow, L. 2018) One noteworthy part of ecological corruption is the consumption of the asset of fresh water on Earth because of phenomenal pollution happens by the expansion of deadly synthetics in water frames as a result of current anthropogenic exercises. Water degradation occurs chiefly due to heavy metals

incorporation like cadmium, copper, lead, arsenic, zinc etc. Cadmium can primarily be found in the earth's crust. It comprises in the companies as an inescapable side-effect of zinc production. It enters the earth principally through the ground, since it is found in fertilizers and pesticides. (“Chemical properties of cadmium”, 2019) Lead is a delicate metal that has known different applications reliably. It has been utilized for application in metal things, connections and pipelines, in paints and pesticides also. (Aenab, 2013) It has caused lead contamination to be a global issue. In vehicle motors lead is burnt, forming lead salts. This lead-cycle caused by human creation is substantially more reached out than the normal lead-cycle. These lead salts enter the earth through drains of autos. (Zaki, et al., 2017; “Chemical properties of lead”, 2019) In this way lead and cadmium normally introduces into the environment.

These are especially infamous because of their abnormal state of lethality. Lead can cause a few undesirable impacts, for example, interruption of the biosynthesis of hemoglobin and feebleness, an ascent in circulatory strain, kidney harm, unnatural birth cycles and unobtrusive premature births, disturbance of CNS, cerebrum harm. (Alimardan & Darabi, 2015; George & Udayashankar, 2017) Where, cadmium exposes human wellbeing to serious dangers, as it can aggravate malignant growth, kidney harm, mucous film devastation, retching, bone harm and in addition influence the formation of progesterone and testosterone.

Therefore, the output for cheap, gainful, and accessible water treatment progressions can't be overemphasized. A couple of methodology have been analyzed for the treatment of dirtied water, yet biosorption is an arrangement of choice since it is unobtrusive, easy to perform, fast, normally well-disposed and less limited by other techno-fiscal examinations that torment distinctive strategies. In any case, low biosorption of metals by many of the biosorbents, limits their utilization.



Subsequently, appropriate synthetic alteration may enhance its adsorption for lethal metals. (Xu, et al., 2017) The *Cl.viscosa* leaves powder is treated with ethanoic acid and formalin to avoid the discharge of color from the leaves powder in to the solution throughout adsorption. (Tharkeswar, et al., 2011) This additionally introduces penetrability on the surfaces, so up its metal chelating ability and sorption capability. Therefore, this study aims to modify weed with combination of above mixture and investigate data. The subsequent adsorbents were utilized to examine the elimination of Cd (II) and Pb (II) particles from fluid solutions, while the data statistics were clarified utilizing isotherm studies. (Rao & Kashifuddin, 2014)

Material and methods

Adsorbent Preparation

The leaves of *Cleome viscosa* were collected from the roadside area of Nagpur city, Maharashtra and were washed with water to remove dust and dirt etc. and were dried in sunlight. The dried leaves were then converted into fine powder by grinding in a mechanical grinder. The powder was sieved and the <300 μm fraction was separated. (Quiser, et al., 2009)

Chemical Pre-treatment

Cleome viscosa leaves powder was subjected to pre-treatment. For this 5 ml of (15%) aqueous formalin and 100 ml of 0.1N acetic acid were blended, to which 10 g of washed leaf powder was included. The blend was stirred and heated at 45°C for 20 hours until the point that the blend converted to thick slurry (Tharakeswar, et al., 2011). The slurry was washed with deionised refined water and afterward dried up for 2-3 hours at 100°C. The ready biomass

was then kept in air tight glass containers to be preserved from moisture. The produced biosorbent was used in the following studies.

Adsorbate Preparation

Lead and cadmium stock of 1000 mg/L solution was set up by dissolving 1.6 g of AR grade lead nitrate and 0.6131 g of cadmium chloride in 1000 ml of distilled water. The pH of the arrangement was observed to be +5. All other chemicals utilized in this investigation were AR Grade. Working solutions of required concentrations were prepared from this stock as required and stored in 500 ml reagent bottles.

Characterization

The SEM and FT-IR spectra was used to determine surface morphology and to demonstrate the functional groups on surface of modified *Cleome viscosa* leaves powder. The SEM analysis shows large voids in the structure acts as cavities to adsorb heavy metals while after adsorption there is a crowding of adsorbed metal as shown in (Fig 1(a) and Fig 1(b)). The surface functional groups were ascertained by FTIR in the modified *Cl.viscosa* leaves. The IR spectra were recorded in the range of 400-4000 cm^{-1} . The various chemical bonds in the sample are responsible for more sorption activity. The broad peak at 3427 cm^{-1} is assigned to alcoholic and phenolic (-OH) group. The bands at 2917 cm^{-1} , 2851 cm^{-1} and 1456 cm^{-1} are assigned to alkanes (-CH₂, -R-CH₂CH₃) CH stretching. The band at 1740 cm^{-1} is assigned to aromatic (C=O) and (C=C) stretching vibrations represents hard bonding of C-atoms. The adsorption peaks at 1231 cm^{-1} and 1016 cm^{-1} shows carboxylic and ester linkages in powder.

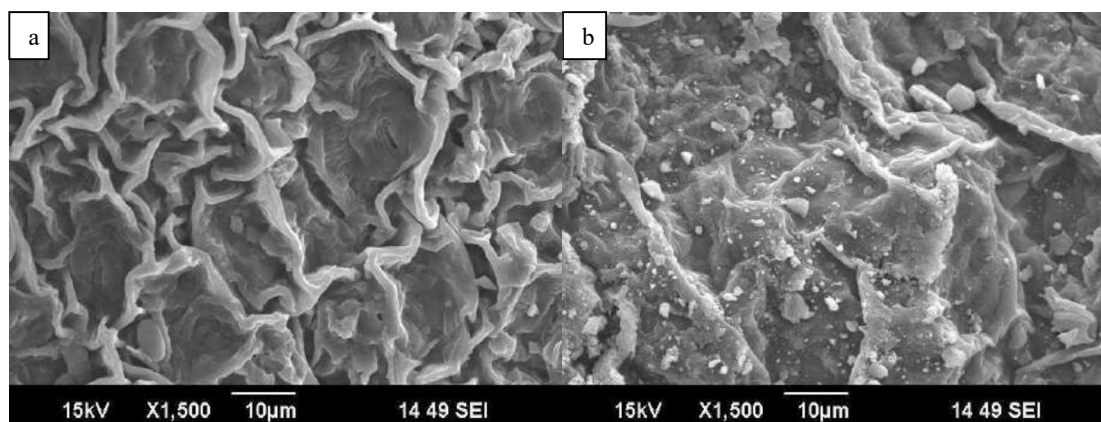


Figure 1 SEM image of *Cl.viscosa* leaves powder a) Before b) After.



The bands at 1533 cm⁻¹ and 1148 cm⁻¹ represents amino groups. This concludes that high percentage

of hydroxyl groups in powder enhances its sorption capacity.

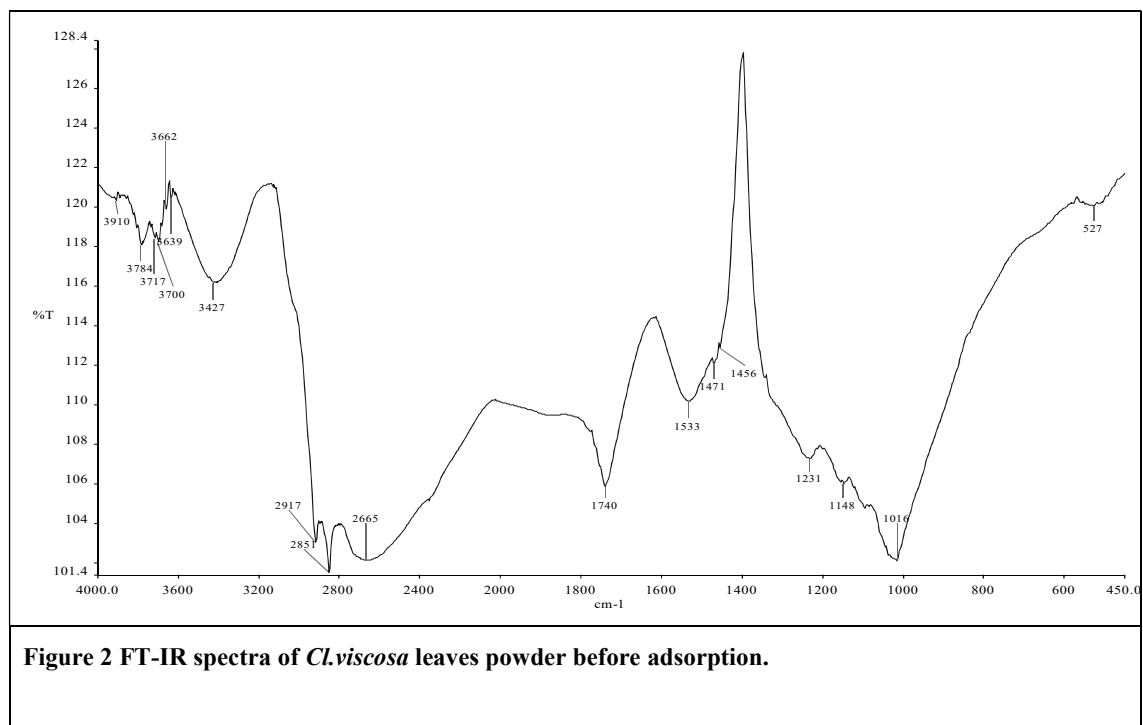


Figure 2 FT-IR spectra of *Cl.viscosa* leaves powder before adsorption.

The adsorption experiments were conducted by mixing various amounts of *Cleome viscosa* leaves powder (0.2-1.0 g/L) in 25 mL of Cd (II) and Pb (II) aqueous solutions (100 mg/L concentration) in 150 ml conical flasks. Reproduce group tests were utilized to decide metal sorption limit of the biomass in 150 mL conical flasks by contacting approximately 0.2g of the plant powders with 25mL of metal solution for determining effect of pH (2-10), time (30 min-150 min), and metal concentration (10 mg/L – 110 mg/L). The conical flasks were shaken on a mechanical shaker throughout the adsorption analysis and groupings of metal in the filtrate arrangements were resolved utilizing the Atomic Absorption Spectrometer (AAS) (GBC906 AA model).

The measure of metal particles adsorbed (q_e) from aqueous solution and percentage removal of metal-ions were determined by using the following equations.

$$q_e = \frac{(C_0 - C_e)V}{m} \quad \dots(1)$$

$$\% \text{ Removal} = \frac{(C_0 - C_e)}{C_0} \times 100 \quad \dots(2)$$

where, q_e is the balance adsorption limit of metal adsorbed on unit mass of the *Cl.viscosa* leaves powder (mg/L); C_0 and C_e are the initial and equilibrium metal concentration respectively; (V) is the volume of metal solution (L); m is the weight of adsorbent (g). (Sebastian, et al., 2017)

The equilibrium process between adsorbent and adsorbate are best clarified by sorption isotherms. The present examination manages the relevance of Langmuir, Freundlich adsorption isothermal models to test information.

Kinetic study

Investigations to decide the adsorption equilibrium time on *Cl. viscosa* leaves powder was performed for a period interim going from 30 to 150 min. A known load of the adsorbent was set in 150 mL stoppered funnel shaped cup containing 25 mL of the metal solution at known concentrations under consistent shaking. The adsorbent was isolated from the metal solution by filtration. The filtrate was gathered and evaluated utilizing Atomic Absorption Spectrometer (GBC906 AA demonstrate). The adsorption quantity at time (t), q_t (mg/g), was determined by:



$$q_t = \frac{(C_0 - C_t) \times V}{m} \dots(3)$$

Where C_0 and C_t (mg/L) are the concentrations of the metal at first and at the time (t) freely. (Hameed. B. et al., 2007). V (L) is the volume of metal course of action and m (g) is the mass of the adsorbent utilized.

Result and discussion

Effect of the adsorbent dose

The investigation of the impact of measure of the adsorbents was completed to watch the minimum possible amount which indicates most extreme adsorption. Impact of the measure of adsorbents was done by choosing an adsorbent scope of 0.2-1.0 g for *Cl. viscosa* leaves powder with a metal concentration of 100 mg/L. It demonstrates that an expansion in the measure of the adsorbent prompts a decline in the expulsion of the lead while rises cadmium evacuation (Fig 3).The more prominent rate adsorption at high adsorbent measurement is because of accessibility of increasingly dynamic active sites of the adsorbents for the adsorption. A measure of 0.2 g was picked as ideal sum for lead and 1 g for cadmium separately for the batch investigation of the adsorption procedure.

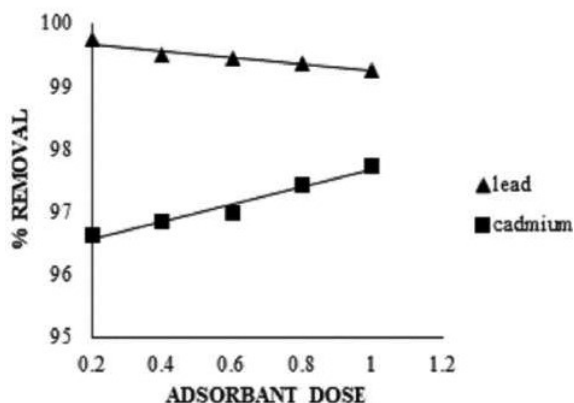


Figure 3 Effect of adsorbent dose on adsorption of metals from the solution

Effect of concentration at varying temperatures

Adsorption experiments for the lead and cadmium metal were carried out by varying the concentration from 10mg/L to 110mg/L. The experimental results show that an increase in the concentration led to an increase in the amount of lead adsorbed while reverse effect showed by cadmium metal. For further studies an optimum concentration of 30ppm for cadmium and 110ppm for lead metal solution was considered. (Fig 4)

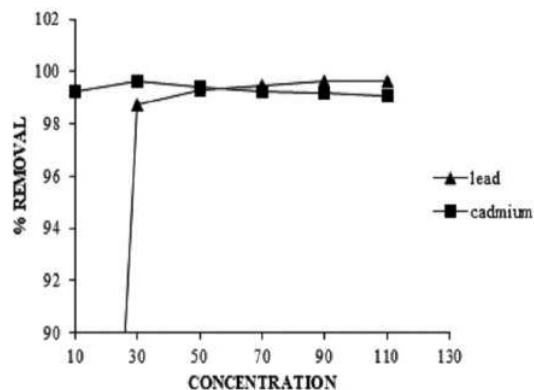


Figure 4 Effect of initial concentration of metal ion solution on adsorption process

Effect of pH

The adsorption experiment was completed demonstrating the impact of pH going from 2-10. The mixture was shaken on mechanical shaker at 100 rpm at 25°C for a hour and a half. For lead the greatest adsorption was acquired at pH 6.0 and for cadmium at pH 5.0. (Fig 5)

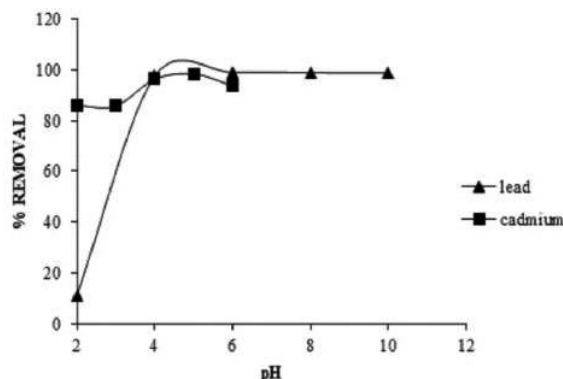


Figure 5 Effect of pH on adsorption of metal ion from the solution

Effect of contact time

Contact time assumes an indispensable job in the adsorption as it proposes that essential required time of contact for inferring most extreme adsorption of the metal at the adsorbent surface. The measure of the lead adsorbed at clear interims of time going from 30 to 150 min was observed for a steady measure of adsorbents (0.2 g for lead and 1.0 g for cadmium) at a specific concentration (Fig 6). With the expansion in time, the adsorption rate of the metal slowly advances and after that diminishes for metal both the metals.

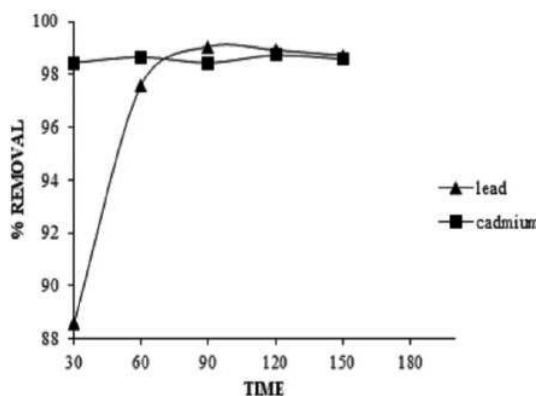


Figure 6 Effect of contact time on adsorption of metal ion from the solution

Adsorption isotherm

The isotherm generally depicts the adsorption framework with some vital data from which we can build up a condition speaking to the outcomes and we can utilize the condition for specific purposes. So as to examine the adsorption isotherm, two balance isotherms were considered: the Langmuir and the Freundlich. (Kareem. S., et al. 2014) The Langmuir adsorption isotherm is the best known about all isotherms depicting adsorption. (Langmuir. I. 1918)

Langmuir isotherm

The Langmuir isotherm suggests that the coverage of adsorbate particles on a rigid surface happens in a monolayer. It is accepted that once the adsorbent site is secured with the metal atoms no further adsorption happens at that site. It additionally proposes that all the adsorption locales are of identical vitality. (Kara. A. et al.,2012) Langmuir condition is expressed as

$$C_e/q_e = 1/Q_m K_L + 1/Q_m C_e$$

Where, q_e (mol/g) and C_e (mol/L) are the measures of the adsorbent and concentration of the metal preparation at equilibrium separately. (Fig 7)

On looking at the regression coefficients acquired for Freundlich and Langmuir it may be anticipated that the Langmuir isotherm is progressively supported by the adsorption procedure. The information introduced above demonstrates that Langmuir adsorption isotherm charts are preferred over Freundlich adsorption isotherms. The favourability of the adsorption procedure was likewise dictated by ascertaining a dimensionless division constant R_L by utilizing condition.

$$R_L = 1 / (1 + K_L C_0)$$

Where C_0 is the underlying metal ion concentration (mol/L) and K_L (L/mol) is Langmuir constant. The

estimation of R_L shows the kind of adsorption isotherm to be unfavourable ($R_L > 1$), favourable ($0 < R_L < 1$) or irreversible ($R_L = 0$).

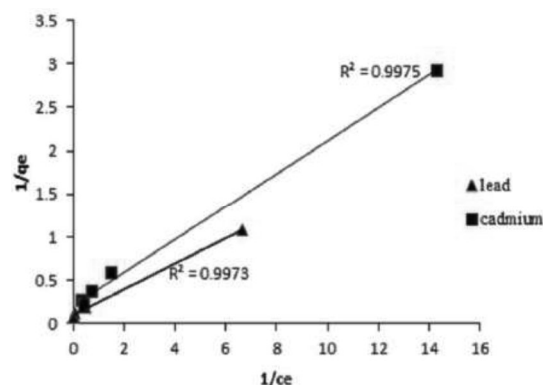


Figure 7 Langmuir adsorption isotherm for the adsorption of metal ion on *Cl.viscosa*.

Freundlich isotherm

The Freundlich isotherm is an after effect of the supposition that the adsorption happens on a heterogeneous surface and non-uniform dissemination of the temperature of adsorption. The Freundlich model was connected to ascertain the adsorption information of metal, according to the given equation:

$$\log(q_e) = \log(K_f) + 1/n \log(C_e)$$

K_f (mol/g) and n are the Freundlich constants, exhibiting adsorption limit and adsorption drive independently. The graphical representations for the Freundlich isotherm of the adsorbent for two metals alongside their R^2 standards are given in (Fig 8). It was discovered that estimations of n lies between $1 < n < 10$ shows positive adsorption.

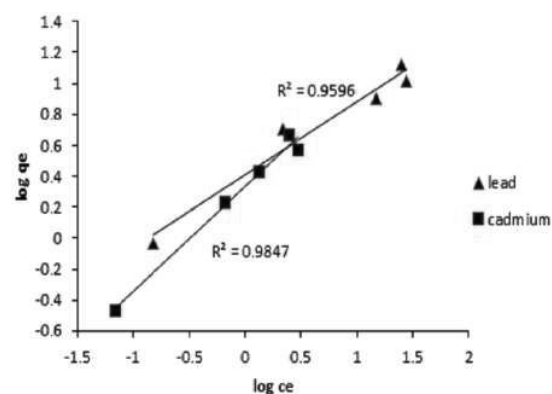


Figure 8 Freundlich adsorption isotherm for the adsorption of metal ion on *Cl.viscosa*.



Kinetics study

So as to decide and decipher the modules of metal particles adsorption over the adsorbent, parameters supervising sorption energy, active sorption data were precisely fitted to the pseudo-second-order. As can be scrutinized, the pseudo second order condition showed up, obviously, to be the best-fitting model. The plot of straight kind of the pseudo second order for the adsorption of lead and cadmium particles is appeared in the (Fig 9). The assertion of the preliminary data with the pseudo second order dynamic model exhibits that the chemisorption controls adsorption of the metals particles onto the adsorbent.

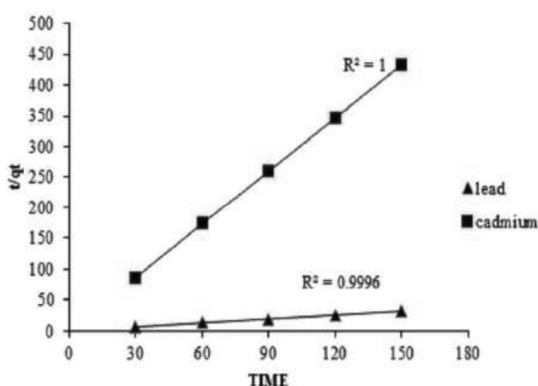


Figure 9 Pseudo Second Order plot for the adsorption of metal ion on *Cl. viscosa*.

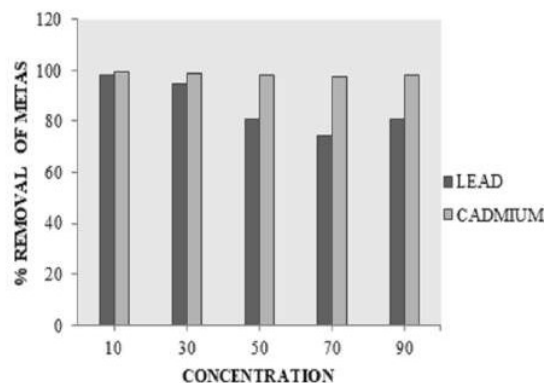


Figure 10 Comparative removal of lead and cadmium by *Cl. viscosa* leaves powder.

Conclusion

From this work it was found that *Cl. viscosa* has higher adsorption efficiency for metal lead and cadmium at any given parameter. The expulsion productivity for cadmium was observed to be great than lead. The equilibrium information were best fitted by the Langmuir adsorption isotherm and the adsorption energy can be effectively fitted to pseudo second order response with $R^2=1$. The leaves of *Cl. viscosa* plant studied in this work are freely available. The treatment of adsorbent is concurring with the standard of green science and less time is required to process high adsorption. Therefore the eco-friendly adsorbent *Cl. viscosa* is relied upon to be naturally and financially achievable for the expulsion of cadmium and lead from aqueous solution.

Acknowledgement

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(RESEARCH PAPER IN CHEMISTRY)

Abstract

Qualitative screening for phytochemical presences using phytochemical tests of three medicinal plants viz., *Annona squamosa*, *Citrus maxima* and *Boerhavia diffusa* for identification of the chemical components using their methanol extract. From this present study we found out that the phytochemical investigation of *Annona squamosa*, *Citrus maxima* and *Boerhavia diffusa* demonstrates the presence of secondary metabolites like Tannins, Terpenoids, Flavonoids, Saponins and Alkaloids. Plant extract analysis showed presence of phytochemicals such as tannins, flavonoids, phenols, glycosides, steroids, terpenoids, saponins and alkaloids, which are known to have presence of the physiological and the medicinal activities as well. Numerous studies have substantiated that the existence of these phytochemicals or bioactive compounds give the physiological as well as medicinal properties to the plants studied in the treatment of different illnesses.

Keywords: Phytochemical, primary metabolites, secondary metabolites, medicinal plants, *Annona squamosa*, *Citrus maxima*, *Boerhavia diffusa*

Introduction

The presence of phytochemical constituents in medicinal plants attributes to the curing as well as for healing of human diseases [1]. The plant kingdom is a wealth of prospective drugs and in the recent years there has been an increasing awareness about the importance of medicinal plants. Medicines from the plants are simply obtainable, more cost-effective, safe, economical and seldom have side effects. They are one of the richest source of traditional systems medicines, modern drugs, food supplements, nutraceuticals, intermediates and chemicals for synthetic drugs. The usage of plants and plant products as medicines can be traced to the beginning of human civilization. The earliest mention of plants for medicinal purpose is found in "Rigveda" in Hindu culture, which is believed to have been written between 4500 - 1600 B.C. and is supposed to be the oldest source of human knowledge. The foundation of medicinal science of India, "Ayurveda" deals with specific properties of drugs and various aspects of science of life and the art of healing in its eight division. The world health organization (WHO) predicted nearly 80% of the population of developing countries still depend for their primary health care needs on traditional medicines, which are mostly plant medicines [2].

Phytochemicals occur naturally in the parts of medicinal plants / vegetables like leaves, roots that give a defence mechanism and offer protection from various diseases. Phytochemicals consists of primary and secondary compounds or metabolites, wherein chlorophyll, proteins and common sugars are included in primary compounds and secondary compounds include terpenoids, alkaloids, phenolics, tannins and flavonoids compounds [1]. These compounds are synthesized by primary or secondary metabolism of the living organisms. Secondary metabolites are chemically and by taxonomy extremely varied compounds with unclear function. These are extensively used in the human therapy, veterinary, agriculture, scientific research and innumerable other areas. Currently around one hundred twenty active compounds which have been isolated from the higher plants and widely used in the modern medicine today, around eighty percent showed a positive correlation between their traditional use of the plants from which they are derived and the modern therapeutic use. Plant products have been used as medicines since ancient time known as phytomedicines. It would be good to have the knowledge of the chemical elements of the plants as this information might provide valuable insight for synthesising the complex chemical substances [2,3,4,5].

For synthesising the compounds having specific activities to treat various health ailments and chronic diseases, the correlation between the phytochemical constituents and the bioactivity of plant would be required to know as well [6].

Preliminary screening of phytochemicals in medicinal plants is very significant need for discovering and developing novel therapeutic

agents which will have improved efficacy. Various research groups have also reported these kinds of studies all through the world. Thus, the present study deals with the screening based on phytochemical tests of s three medicinal plants viz., *Annona squamosa*, *Citrus maxima* and *Boerhavia diffusa* for identifying their chemical constituents. All these plants show different bioactivities which were later correlated with the existence of some specific phytochemical constituents.

Materials and Methods**Plant materials**

The present study includes three plant species namely, *Annona squamosa* L.(Annonaceae), *Citrus maxima* L.(Rutaceae), *Boerhavia diffusa* L.(Nyctaginaceae).

Sample collection

Out of these three medicinal plants two plants, *Annona Squamosa* and *Boerhavia diffusa* were collected locally from Nagpur University area and *Citrus maxima* plant was collected from Bengaluru, Karnataka. The plants collected were identified botanically in department of Botany, Nagpur University. Different parts of these medicinal plants were used for phytochemical analysis.

1. *Citrus maxima* belongs to Rutaceae family. *Citrus maxima*, perennials commonly known as Papanus or pomelo having presence throughout India. Like other citrus plant, these are rich in Vitamin C and are generally eaten as fruit. It has been used in the native medication system as tranquillizer for nervous infections, epilepsy, uncontrollable coughs and for treating haemorrhagic diseases. It is said to be a cardiac stimulant, also having antitoxic and appetizing property [7]. For this present phytochemical analysis leaves, stem and fruit pulp of *Citrus maxima* were used.

2. *Boerhavia diffusa* L. belongs to Nyctaginaceae family, commonly known as 'Punarnava' in the Indian system of medicine, is a perennial creeping herb found throughout the waste land of India. The roots are presumed to be diuretic and laxative and are given for the treatment of jaundice, ascites and ansarca. The *Boerhaavia* species have been used for medicinal purpose in different societies from ancient times. The herbal medicine has progressed and changed throughout the years. This plant has gained lot of importance in the field of phytochemistry because of its various pharmacological and biological activities [8]. Whole plant of *Boerhavia diffusa* L. was used for this present phytochemical analysis.

3. *Annona squamosa* L. is commonly known as the custard apple tree and belongs to the Annonaceae family. It is observed to have a wider cultivation in the tropical regions. Also, since it is edible in nature, it is grown all through India. The fruit pulp tastes very sweet because of its higher sugar content to the dry mass, so it has higher calorie value. This plant is known to exhibit various medicinal properties. *Annona squamosa* from very old folklores have been reported as an anti-tumor, anti-diabetic, anti-inflammatory, anti-lipidemic,

antioxidant and as an insecticidal agent. The presence of the cyclic peptides characterizes the same. Moreover, for overcoming the hysteria and fainting spells, inhaling of the crushed leaves was done and was also applied on the ulcers and wounds for curing. Dysentery was treated by taking the leaf decoction [9]. Parts of *Annona squamosa* plant i.e fruit pulp and leaves were used for the present phytochemical analysis.

Preparation of plant extracts

Solvent extraction

Soxhlet extraction method was used to prepare the crude plant extract using methanol as the extractant. 10gm of powdered plant material was uniformly packed into a thimble and extracted with 100ml of methanol. This process of extraction was done for 18- 24 hours continuously. Chlorophyll was removed from the extract wherever necessary by treating it in the separating funnel with Methanol extract with hexane. By keeping beakers in water bath set at 55°C, the extracts were concentrated by having all the solvent evaporate. Dried extract was kept in refrigerator at 4°C for its future use in phytochemical analysis.

Qualitative phytochemical analysis

Using methanol extract for all samples and following the standard protocols, preliminary qualitative phytochemical screening was carried out [10,11,12].

1. Detection of alkaloids

i. Mayer's test: A few ml of plant extract was taken and two drops of Mayer's reagent was added along the sides of test tube. Appearance of white creamy precipitate indicated the presence of alkaloids.

ii. Dragendroff's test: 3ml of the filtrate was taken and 1ml of Dragendroff's reagent (potassium bismuth iodide) was added. The appearance of brick red precipitate indicated the presence of alkaloids.

iii. Wagner's test: Few drops of Wagner's reagent was mixed with few ml of plant extract along the sides of test tube. A reddish- brown precipitate established this test as positive.

2. Detection of fixed oils and fats

Spot test: A small quantity of plant was taken and this extract was pressed between two filter papers. Presence of oil stain on the paper indicated the presence of fixed oils.

3. Detection of terpenoids

0.5 ml of chloroform was added to 1 ml of extract followed by an addition of few drops of concentrated sulphuric acid. Formation of reddish brown precipitate indicated the presence of terpenoids in the extract.

4. Detection of saponins

Foam Test: 20 ml of water was added to 2g extract. Observation of persistent foam after shaking this vigorously, indicated the presence of saponins.

5. Detection of flavonoids

i. Shinoda's test: 2ml extract was dissolved in alcohol and a piece of magnesium was added, concentrated hydrochloric acid was added dropwise and heated. Presence of flavonoids is indicated by the appearance of magenta colour.

ii. Alkaline reagent test: Aqueous solution of sodium hydroxide was added to 2ml extract. Change in the blue to violet colour indicated presence of anthocyanins, blue to yellow colour indicated presence of flavones and yellow to orange colour indicated presence of flavonones.

6. Detection of steroids

i. Libermann – Burchard reaction: 2 ml extract was mixed with chloroform and 1-2 ml acetic anhydride was added. From the sides of test tube, 2 drops of concentrated sulphuric acid were added. Appearance of first red, then blue and finally green colour indicated the presence of steroids.

ii. Salkowski test: 2ml of chloroform and 2 ml of concentrated H₂SO₄ was added to 2 ml of plant extract and shaken well. If the chloroform layer appeared red and acid layer appeared greenish yellow fluorescent, this confirmed the presence of steroids.

7. Detection of coumarins

5 ml of ethanolic solution was evaporated and the residue was dissolved in 1-2 ml of hot distilled water. The volume was divided into two parts. Half the volume was taken as a witness and to another volume 0.5 ml 10% NH₄OH was added. Two spots were put on filter paper and examined under UV light. Intense fluorescence indicated the presence of coumarins.

8. Detection of gum and mucilage

2.5ml of absolute alcohol was added to 1ml of extract with constant stirring. Then the precipitate was dried in air and examined for its swelling properties. Swelling observed would indicate presence of gum and mucilage.

9. Detection of volatile oils

0.1 ml of diluted sodium hydroxide and a small amount of diluted hydrochloric acid were added to 2 ml of extract. Presence of volatile oils is indicated by the formation of a white precipitate.

10. Detection of carotenoids

10ml of the extract was taken in a test tube and was evaporated to dryness on a water bath. This was followed with the addition of 2-3 drops of saturated SbCl₃ in CHCl₃ to the residue. A blue-green colour eventually changing to red indicated the presence of carotenoids.

11. Detection of phenols

i. Ferric chloride test: 5 ml of distilled water was added to 50 mg extract in a test tube. Few drops of neutral 5% ferric chloride solution were also added. The presence of phenolic compound is indicated by a dark green colour.

ii. Liebermann Test: When phenol is treated with sodium nitrite in presence of concentrated sulphuric acid, deep blue or green colour is produced. On treatment of water the blue or green colour changes to red or brown colour. Formation of indophenol gives the presence of the red colour. The red colour again changes to blue or green by addition of strong alkali like sodium hydroxide. The presence of phenol group is indicated by blue or green colour.

12. Detection of tannins

i. Ferric chloride test: 5 ml of distilled water was added to 50 mg extract in a test tube. Few drops of neutral 5% ferric chloride solution were also added. The presence of phenolic compound is indicated by a dark green colour.

ii. Gelatine test: 50 mg extract was dissolved in 5 ml of distilled water and 2 ml of 1% solution of gelatine containing 10% NaCl was added. White precipitate indicated the presence of phenolic compounds.

iii. KI Test: Few drops of KI were added to the filtrate, the change in colour from pink to brown indicated presence of tannins.

Data analysis

Whenever the test reagent was added to the prepared sample for the phytochemical test, the change of colour was observed. The result was recorded as present (+) or absent (-) depending on the outcome of the test. All experiments were done in triplicates.

Phytochemicals	Annona squamosa	Annona squamosa	Citrus maxima	Citrus maxima	Citrus maxima	Boerhavia diffusa
	(Fruit pulp)	(Leaves)	(Leaves)	(Fruit)	(Stem)	
Phenols	+	+	+	+	+	+
Alkaloids	+	-	+	+	+	+
Saponins	+	+	+	-	+	-

Tannins	+	+	+	+	+	+
Flavonoids	+	+	+	+	+	+
Steroids	+	+	+	-	-	+
Terpenoids	+	+	+	-	-	+
Coumarins	-	+	+	+	+	+
Gums & Mucilage	+	-	-	+	-	-
Volatile Oils	-	+	-	-	-	-
Fixed Oils and Fats	-	+	-	-	-	-
Carotenoids	-	+	+	-	-	+

(+) = Presence, (-) = Absence

Results and Discussion

From this present study we found out that the phytochemical screening of *Annona squamosa*, *Citrus maxima* and *Borehavia diffusa* indicates the presence of Tannins, Saponins, Flavonoids, Terpenoids and Alkaloids.

The different analysis of the plant extracts showed the existence of phytochemicals such as flavonoids, saponins, glycosides, phenols, tannins, steroids, terpenoids, and alkaloids, which are known to display medicinal as well as physiological activities. Several academics have stated the antispasmodic, analgesic and antibacterial [12, 13] properties of alkaloids. Glycosides are known to lower the blood pressure according to many reports [14]. Phenolic compound holds biological properties such as anti-carcinogen, apoptosis, anti-aging, anti-inflammation, anti-atherosclerosis, cardiovascular protection and improvement of endothelial function, as well as inhibition of angiogenesis and cell proliferation activities [15]. The plant extract also contains saponins which are known to yield inhibitory effect on inflammation [16]. Steroids have been stated to possess antibacterial properties [17] and they are very important compounds especially due to their relationship with compounds such as sex hormones [18]. The growth of many fungi, yeasts, bacteria and viruses can be inhibited by tannins [19].

Conclusion

The presence of medicinally important phytochemicals in the plants was studied. Preliminary qualitative phytochemical screening showed presence of phenols, steroids, terpenoids, alkaloids, tannins, flavonoids, saponins and gums & mucilage in *Annona squamosa* (fruit pulp) sample. Presence of phenols, tannins, flavonoids, steroids, terpenoids, saponins, coumarins, volatile oils, fixed oils and fats and carotenoids was found in *Annona squamosa* (leaves) sample. Presence of phenols, flavonoids, steroids, terpenoids, saponins, coumarins, tannins and carotenoids was found in *Citrus maxima* (leaves) sample. Presence of phenols, tannins, flavonoids, alkaloids, coumarins and gums & mucilage was found in *Citrus maxima* (fruit) sample. Presence of phenols, tannins, flavonoids, alkaloids, saponins and coumarins was found in *Citrus maxima* (stem) sample. Presence of phenols, tannins, flavonoids, steroids, terpenoids, alkaloids, coumarins and carotenoids was found in *Boerhavia diffusa* sample. Several studies proved that the presence of these phytochemicals or bioactive compounds contribute medicinal as well as physiological properties to the plants studied in the treatment of different ailments. Therefore, extracts from these medicinal plants can be a good source for novel drugs. The traditional medicine use is already there for these plants as well as it is suggested that further work should be carried out to isolate, purify, and characterize the active constituents responsible for the activity of these plants on different types of life threatening diseases as well as day to day life diseases.

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LANGMUIR, FREUNDLICH, TEMKIN AND DUBININ–RADUSHKEVICH ISOTHERM STUDIES OF EQUILIBRIUM SORPTION OF Pb (II) ONTO *A.FICOIDEA*

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Abstract : In this investigation, the adsorption process of pre-treated *Alternanthera ficoidea* leaves powder was examined concerning lead metal. The batch adsorption method was employed for optimum pH, contact time, initial metal concentration and different temperature. The Langmuir, Freundlich, Temkin and DRK isotherms were studied. Langmuir adsorption isotherm was found to be favourable at high temperature with maximum monolayer capacity of 39.68 mg g⁻¹ at 304K. From DRK isotherm, energy E was less than 8 KJmol⁻¹, suggesting that Pb (II) adsorption onto *A.ficoidea* leaves powder is physical sorption. The adsorption procedure showed negative Gibb's free energy which indicates spontaneity of the reaction. The enthalpy and entropy were positive which reveals physical adsorption and endothermic nature of the process. The research suggests the applicability of pre-treated *A.ficoidea* leaves powder for the removal of Pb (II) ions.

Keywords: *A.ficoidea*, adsorption, lead, isotherm, thermodynamics.

I. INTRODUCTION

Fast monetary development and urbanization are stressing demand and supply gap of water, also causes environmental change which could additionally affect the accessibility of water in the nation as it compromises the water cycle [1]. The untreated modern effluents and sewage being discharged into water bodies become unhygienic. A detailed inspection directed by the Central Water Commission says 42 streams in India have two harmful substantial amounts of lead and iron above permissible limits. This report observed that enormous measures of lead (from 69 streams) were obtained throughout three seasons—summer, winter and storm [2]. The expulsion of lead particles from water is one of the significant parts of contamination control. The damage of water with the lead species mostly emerges because of the ill-treated transfer of effluents from toxic enterprises. Lead is the widespread lethal metal contaminant of environment that causes fragility issue, inconvenience and injury to the living creatures. Lead may show some dependable negative wellbeing effects such as colic, obstruction and frailty.

In this manner, dense metal particle elimination from sewage effluents and other water assets is fundamental to guarantee natural and human security. The worry of ecologist as well as the administration on this issue had come up with tremendous research on building up a trend setting innovation for the expulsion of substantial metals from water and wastewater [3]. Use of activated carbon as an adsorbent is a successful and straightforward strategy for waste treatment because of its high interior porosity and thus high absorptivity.

In recent years, the high cost of activated carbon has encouraged many researchers for the use of renewable and low-cost adsorbent precursors. Physical activation and chemical activation are the two commonly used methods to prepare the adsorbent. The chemical activation method using different chemicals are highly preferred giving a large surface area thereby high micropore yield [4]. Similar type of framework is used for the removal of lead particles by *A.ficoidea* as adsorbents. The researchers have made use of different plant materials like *A. nilotica* [5], *Manihot esculenta* [6], *Ficus benghalensis* [7], *Sida acuta* [8], saffron leaves [9], *E. crassipes* [10], Aloe vera leaves [11] for the expulsion of lead particles. The easily available decorative plant *Alternanthera ficoidea* is viewed as an intrusive and tricky weed. The goal of this examination is to use tremendously accessible wild *Alternanthera ficoidea* plant leaves as an adsorbent to discard lead from known concentrations of the lead solution by improving the diverse physicochemical parameters. In this research, plant leaves powder of *A.ficoidea* was used to evaluate the effect of factors such as contact time, amount of adsorbent, initial pH, initial concentration of lead metal ion and temperature for the biosorption of lead metal ion in aqueous solution.

II. MATERIALS AND METHODS

2.1. Chemicals and Instruments

All the chemicals used in this work were purchased from Merck. The stock solution of Pb (II) was prepared by dissolving lead nitrate in distilled water and the desirable concentrations (10 to 110 mg L⁻¹) of Pb (II) were obtained [12], in 10 - 110 mg/L range. The solution pH was measured by pH meter and adjusted using HCl and NaOH. Batch adsorption studies were done on a mechanical shaker with 100 rpm.

2.2 Sample Collection and Preparation

The leaves of *Alternanthera ficoidea* were collected from the roadside area of Nagpur city, Maharashtra and were washed with water to remove dust and dirt etc. and were dried in sunlight. The dried leaves were then converted into fine powder by grinding in a mechanical grinder. The powder was sieved and the <300 µm fraction was separated.

Alternanthera ficoidea leaves powder was subjected to pre-treatment. For this, 5 ml of 15% aqueous formalin and 100 ml of 0.1N acetic acid were blended, to which 10 g of washed leaf powder was added. The blend was stirred and heated at 45°C for 20 hours until the point that the blend converted to thick slurry. The slurry was washed with deionised refined water and afterwards dried up for 2-3 hours at 100°C. The ready biomass was then kept in airtight glass containers to be preserved from moisture. The produced biosorbent was used in the following studies [13].

2.3. Characteristics of adsorbent

The SEM and FT-IR spectra were utilized to decide surface morphology and to exhibit the functional groups on the surface of modified *Alternanthera ficoidea* leaves powder.

2.4. Batch Adsorption Studies

The Pb (II) adsorption isotherms were determined using adsorbent dose of (0.2-1.0 g/L), initial concentrations of Pb (II) (10 to 110 mg/L), temperature at (T = 294, 299, 304 K) with constant pH +5 at 100 rpm. The *A.ficoidea* - Pb (II) suspensions were placed on a shaker for 90 min to establish the equilibrium condition. At that point, 10 ml aliquots of the *A.ficoidea* - Pb (II) suspensions were separated utilizing filter paper (Whatman No. 41). The leftover Pb (II) ions were identified by Atomic Absorption Spectrometer (AAS) (GBC906 AA model).

2.5. Data Analysis

Equation (1) is the per cent of Pb (II) removal by *A.ficoidea* and Equation (2) is amount of adsorption at equilibrium (q_e , mg/g):

$$q_e = \frac{(C_o - C_e)V}{m} \quad \dots (1)$$

$$\% \text{ Removal} = \frac{(C_o - C_e)}{C_o} \times 100 \quad \dots (2)$$

Where C_o and C_e = initial and equilibrium concentrations of Pb (II) ions; v = total volume; w = weight of adsorbent. All the experiments were repeated for triplicate values.

III. RESULTS AND DISCUSSION

3.1. Characterization of adsorbent

Fourier transform infrared (FT-IR) spectroscopy was used to evaluate the functional groups on the surface of *A.ficoidea* within the range of 600 - 4000 cm⁻¹ [14], as shown in "Fig. 2". FT-IR measurement for *A.ficoidea* showed the presence of the following groups: O-H stretching (a strong peak at 3428 cm⁻¹), C-H stretching (a weak peak at 2851 cm⁻¹), C=O (1743 cm⁻¹), N-H (1533 cm⁻¹) and N=O, N-O, S=O (1317 cm⁻¹). The portrayal of *A.ficoidea* as adsorbent is a significant investigation to understand the behaviour of Pb (II) deposition onto *A.ficoidea* surface. Additionally, the degree of substantial metal adsorption onto biomass is impacted by the physicochemical properties.

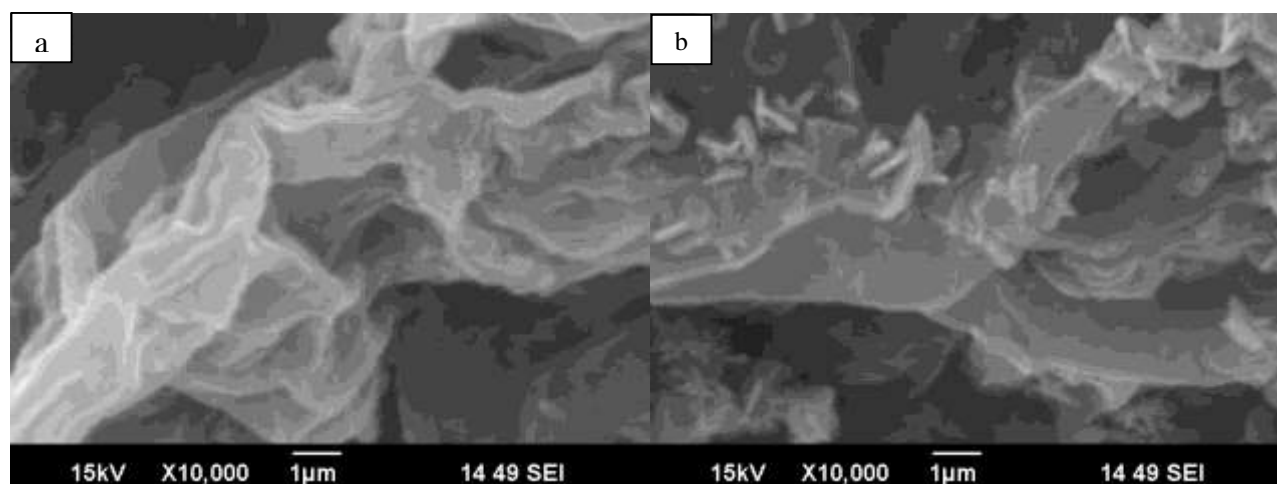


Fig 1. SEM image of *A.ficoidea* leaves powder a) before b) after

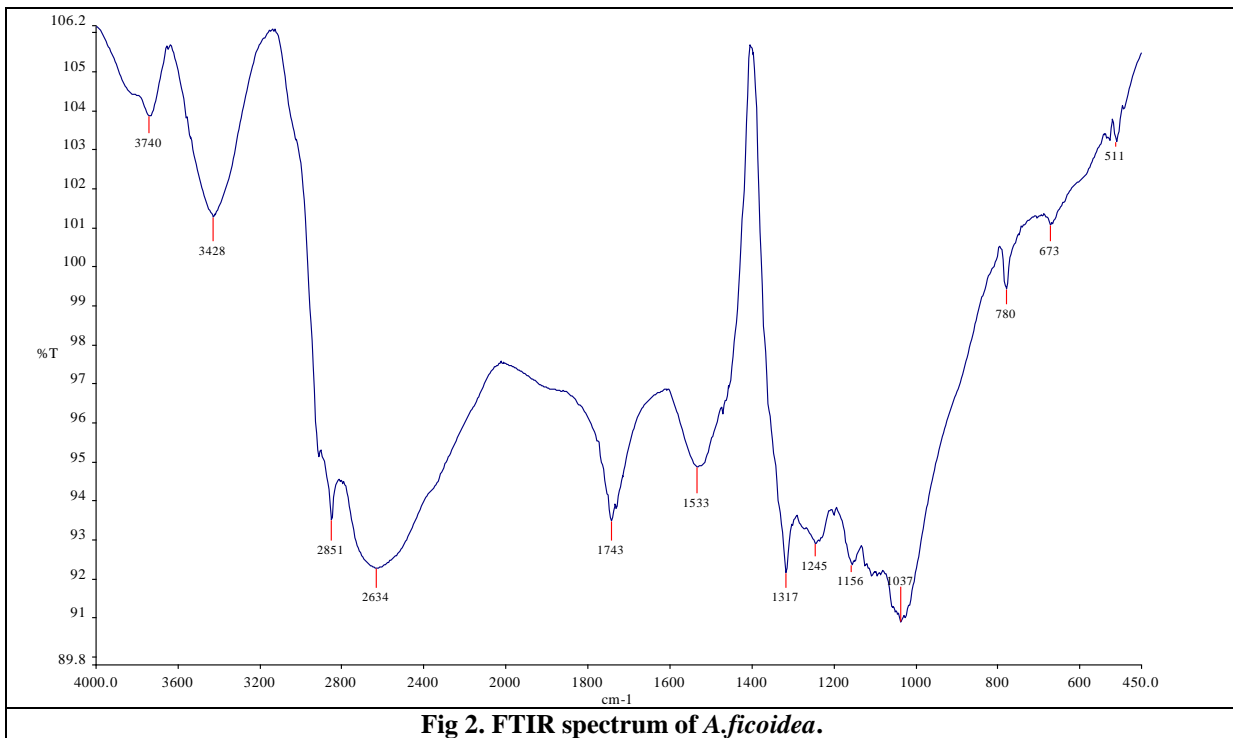


Fig 2. FTIR spectrum of *A.ficoidea*.

3.2 Adsorption Isotherm

3.2.1. Freundlich Isotherm

The Freundlich isotherm is generally utilized for heterogeneous surface vitality frameworks (non-uniform conveyance of sorption heat). Equation (3) is the Freundlich expression:

$$\text{Log}(q_e) = \text{log}(K_f) + 1/n \text{log}(C_e) \quad \dots(3)$$

Where K_f and n are Freundlich constants,

K_f = adsorption capacity

n = biosorption intensity

q_e = amount of Pb (II) per unit mass of adsorbate (mg/g)

C_e = equilibrium concentration (mg/L).

The q_e versus C_e plot decides the Freundlich constants. The graph of the adsorption isotherm model is displayed "Fig. 3". The adsorption constants and the relationship coefficients are additionally recorded in (Table 1). As per Freundlich isotherm, the $1/n$ values lie somewhere in the range of 0 and 1, this shows good Pb (II) adsorption onto *A.ficoidea* at low temperature and a solid bond between Pb (II) and *A.ficoidea* surface. Additionally, n values indicate ionic interactions of Pb (II) on *A.ficoidea* in the primary stage. The Freundlich condition is the best fit with $R^2 = 0.9923$ at low temperature.

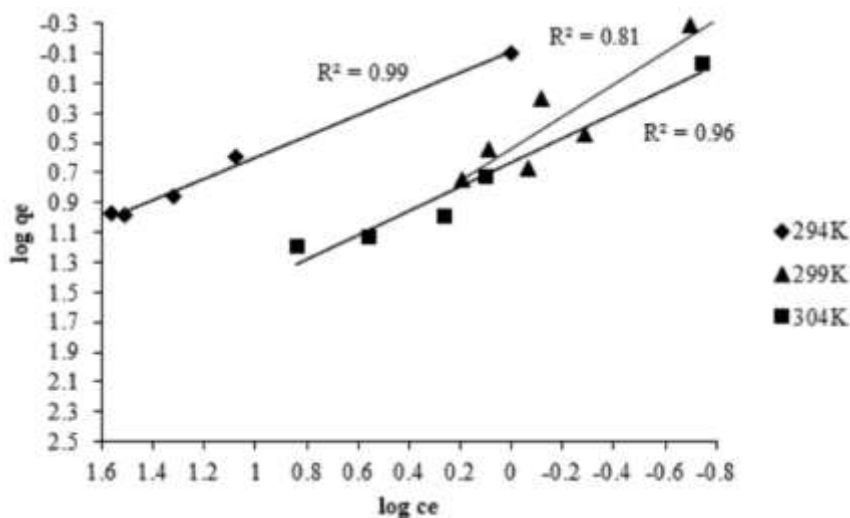


Fig 3. Freundlich isotherm for sorption of Pb (II) using *A.ficoidea* leaves

3.2.2. Langmuir Isotherm

The Langmuir isotherm is typically used for monolayer adsorption on homogenous regions. Equation (4) is the Langmuir articulation:

$$C_e/q_e = 1/Q_m K_L + 1/Q_m C_e \quad \dots (4)$$

Where, Q_m = monolayer sorption limit (mg/g)

K_L = Langmuir equilibrium constant (L/g).

A plot of C_e/q_e versus C_e yields a straight line “Fig. 4”. As per the Langmuir model, q_m and K_L values are (Table 1) elevated with temperature demonstrating that the Pb (II) particles are adsorbed by *A.ficoidea* at high temperature. This shows the high adsorption liking towards lead particles and bond strength between Pb (II) and *A.ficoidea*. R^2 values suggest that adsorption follows Freundlich at low temperature and Langmuir at high temperature. Equation (5) is utilized to decide the steady partition factor, R_L :

$$R_L = 1/1+ (1+K_L C_0) \quad \dots (5)$$

Where:
 C_0 = initial concentration
 K_L = the constant related to the energy of adsorption (Langmuir Constant).
 The estimation of R_L shows the isotherm shape to be unfavorable ($R_L > 1$), favorable ($0 < R_L < 1$) and irreversible ($R_L = 1$) [15]. The R_L values were under 1, which affirmed that the Pb (II) adsorption onto *A.ficoidea* is good.

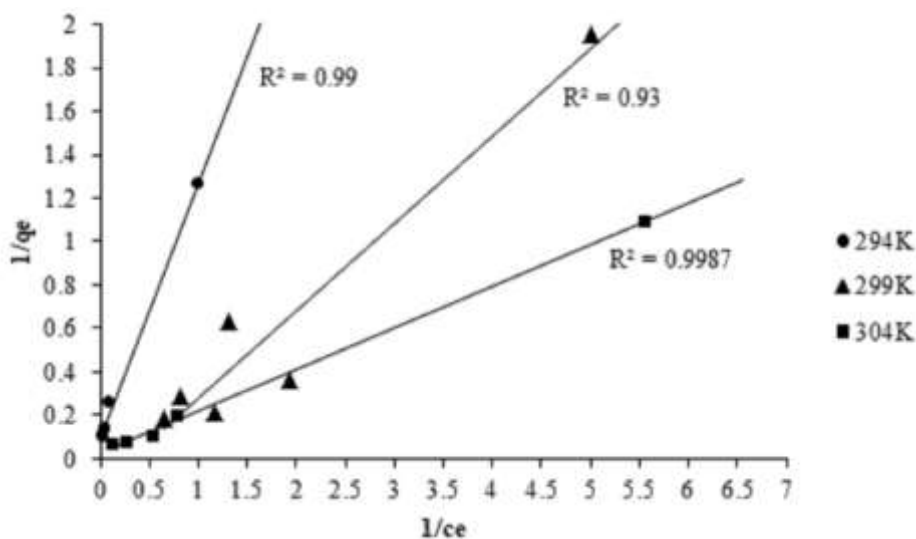


Fig 4. Langmuir isotherm for sorption of Pb (II) using *A.ficoidea* leaves

Table No .1 : Adsorption isotherm constants of Pb ions on *A.ficoidea*

Temp	Langmuir isotherm				Freundlich isotherm			
	K_L	q_m	R_L	R^2	K_f	$1/N$	R^2	
K	L/g	L/mg			L/g			
294	0.081	10.5263	0.1249	0.99	0.7725	0.7059	0.99	
299	0.3135	7.8926	0.0996	0.93	3.4986	1.081	0.8	
304	0.1316	39.6825	0.085	0.99	4.2501	0.8131	0.95	
Temp	Temkin isotherm				DRK isotherm			
	K_T	q_m	B	R^2	B	q_m	E	R^2
K	J/mol	L/g			J/mol	L/g	J/mol	
294	2.405	1.0509	1016.35	0.88	1.4174	8.4081	0.5939	0.92
299	2.1382	5.9487	1162.6	0.7	0.6852	11.7635	0.8542	0.82
304	0.5348	5.4223	593.48	0.92	0.637	17.914	0.8859	0.97

3.2.3. Temkin Isotherm

Temkin demonstrates the effect between the metal particles and adsorbent on adsorption isotherms. The heat of adsorption of the considerable number of atoms in the layer would diminish directly with surface adsorption. [16].

$$q_e = B \ln A_T + B \ln C_e \quad \dots (6)$$

$$B = RT/b_T \quad \dots (7)$$

Where,

$B = RT/b$ [constant related to heat of sorption (J/mol) obtained From the Temkin plot (q_e versus $\ln C_e$)]

A (slope) = Temkin isotherm equilibrium binding constant (L/g);

b (intercept) = Temkin isotherm constant;

R = universal gas constant ($8.314 \text{ J}\cdot\text{mol}^{-1}\cdot\text{K}^{-1}$)

T = Temperature at 294 K, 299 K and 304 K, shown in "Fig. 5" and listed in Table 1.

The experiment shows that as the temperature is elevated from 294 to 304 K, the heat of adsorption of Pb (II) onto the outside of *A.ficoidea* diminishes from 1016.35 to 593.48 Jmol^{-1} , (Table 1). Likewise, the b values also demonstrate that the adsorption process is exothermic.

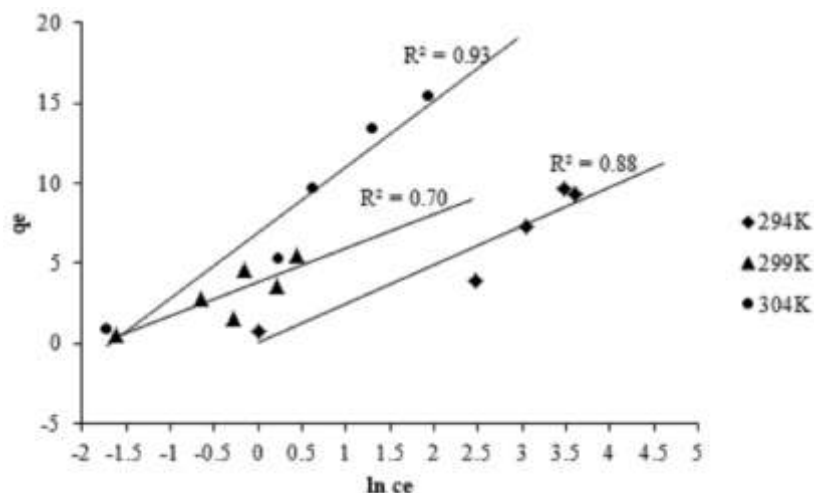


Fig 5. Temkin isotherm for sorption of Pb (II) using *A.ficoidea* leaves

3.2.4. Dubinin-Radushkevich (DRK) Isotherm

The Dubinin Radushkevich (D-R) isotherm is used to determine the apparent energy of Pb (II) adsorption onto *A. ficoidea* and has the linear form as the following equation:

$$\ln q_e = \ln q_m - \beta \varepsilon^2 \quad \dots (8)$$

$$\varepsilon = RT \ln (1+1/c_e) \quad \dots (9)$$

Where,

q_m = maximum sorption capacity (mg/g);

β = activity coefficient constant related to sorption energy;

ε = Polanyi potential.

The DRK parameters are determined from the slop of the plot of $\ln q_e$ versus ε^2 gives β ($\text{mol}^2 \text{ J}^{-2}$) and q_m (mg g^{-1}) in "Fig. 6" and recorded in Table 1. The β gives the mean free energy (E) of sorption per particle:

$$E = 1/\sqrt{2} \beta \quad \dots (10)$$

If E is somewhere in the range of 8 and 16 kJ mol^{-1} , the adsorption procedure continues by particle trade or chemisorptions, while for estimations of $E < 8 \text{ kJ mol}^{-1}$, the adsorption procedure is of a physical sort. The value of E is less than 8 KJmol^{-1} in this process that reveals the sorption follows physical way.

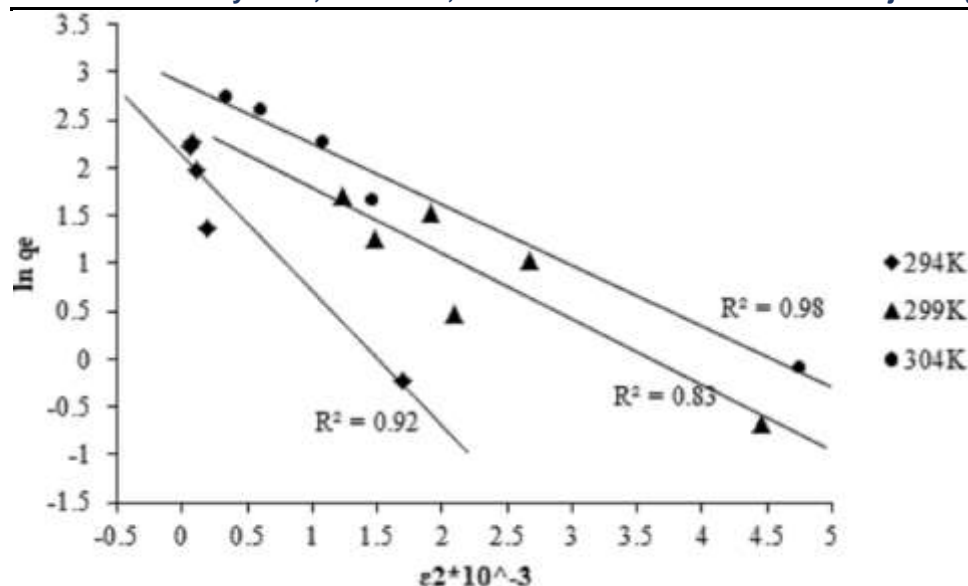


Fig 6. DRK isotherm for sorption of Pb (II) using *A.ficoidea* leaves

3.4. Adsorption Thermodynamics

Thermodynamic parameters were determined to know the spontaneous nature of the reaction. The change in free energy (ΔG°), enthalpy (ΔH°) and entropy (ΔS°) of sorption process were determined by utilizing the accompanying conditions:

$$K_D = q_e/c_e \quad \dots (11)$$

$$\Delta G^\circ = -RT \ln K_D \quad \dots (12)$$

$$\ln K_D = -\Delta G^\circ / RT = -\Delta H^\circ / RT + \Delta S^\circ / R \quad \dots (13)$$

Where, K_D is the distribution constant. Equation (11) is used to calculate the thermodynamic equilibrium constant (K_D) for Pb (II) - *A.ficoidea* adsorption [16], q_e is the amount of metal ion sorbed (mg g^{-1}) at equilibrium and C_e is the equilibrium Pb (II) concentration adsorbed on *A.ficoidea* at (mg L^{-1}). Thermodynamic parameters were estimated from the Van't Hoff plot of $\ln K_D$ versus $1/T$. The results are shown in "Fig. 7". The values of K_D , ΔG° , ΔH° and ΔS° for sorption of Pb (II) on *A.ficoidea* leaves powder were calculated using Eq. (11)-(13) and are given in Table 2.

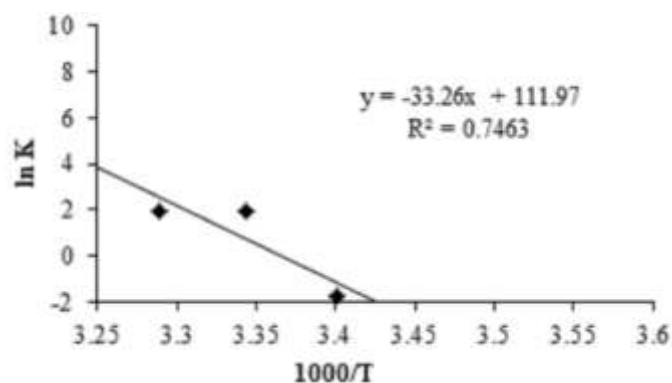


Fig 7. Plot of $\ln K_D$ versus $1/T$ for estimation of thermodynamic parameters for sorption of Pb (II) using *A.ficoidea* leaves

Table No.2 : Thermodynamic parameter for the sorption of Pb (II) on *A.ficoidea* leaves powder.

Temp	ΔG°	ΔH°	ΔS°
K	KJ mol^{-1}	KJ mol^{-1}	$\text{KJ K}^{-1} \text{mol}^{-1}$
294	-13.2618	0.039718	0.146376
299	-13.5366		
304	-14.5727		

The negative estimations of ΔG° at all temperature demonstrate the spontaneity of Pb (II) adsorption by *A.ficoidea*. The negative ΔG° values, under (-15 kJ mol^{-1}), are associated with physical co-operation between *A.ficoidea* and Pb (II) particles. The positive estimation of ΔH° affirms the endothermic idea of Pb (II) - *A.ficoidea* adsorption process demonstrating physical adsorption with rise in temperature. The estimation of ΔS° can be utilized to depict the uncertainty in the adsorption process. The positive estimation of ΔS°

mirrored the fondness of the adsorbent for specific of substantial metal particles and affirms the expanded randomness at the solid interface in adsorption [17].

IV. CONCLUSION

The outcomes of this exploration suggested that *A.ficoidea* can be utilized as an adsorbent for Pb (II) particles. The various isotherm and the thermodynamic examinations affirmed the test results. The harmony was the best portrayed by Langmuir isotherm at high temperature and Freundlich at low temperature. Temkin isotherm and DRK isotherms uncover that heat of adsorption decreases as the energy of the process was below 8 KJmole⁻¹. The thermodynamics of the adsorption procedure was spontaneous. The positive estimations of ΔH° demonstrated that the Pb (II) adsorption onto *A.ficoidea* was a physical phenomenon and endothermic in nature.

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Design, Synthesis And Biological Activities Of New Alkylated Isatin-Derivatives

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Abstract: 5-bromo-Isatin, was opted as the base for synthesizing prospective Isatin derivatives which were synthesized for hypothesized biodynamic activities such as anti-bacterial, anti-fungal and antitumor. The synthesized Isatin derivative were characterized by spectrums and were examined for various biological activities.

Keywords: Isatin, Cancer cell-lines, Anti-tumor activity, Anti-fungal activity, Anti-bacterial activity

INTRODUCTION

Derivatives of Isatin (1-H-indole-2,3-dione) possess a versatile bioactivity [1] and is used as starting compound for synthesizing a wide range of heterocyclic compounds in drugs preparation [2-6]. The past studies on isatin derivatives are found to possess antitumor, antibacterial, antifungal, anti-HIV, anticonvulsant, antiviral, anti-inflammatory, and many more other biodynamic properties [6]. Drugs containing the isatin skeleton are used to treat diseases such as epilepsy [7], tuberculosis [8], and bulimia [9]. Considering the precedential biological properties of Isatin and its derivatives, there is further scope to create and explore Isatin derivatives for emerging drug-targets. Previous research on isatin derivatives shows that mono-substituted Isatin at aryl ring has greater cytotoxic and other biodynamic properties over un-substituted Isatin. Further, bromo-substituted Isatin was found to possess greater cytotoxic properties over chloro, nitro, hydroxy substituted Isatin. It was found that halogenation substituted Isatin derivatives are the most active compounds, with 5-bromo, 5-iodo, and 5-fluoro isatin being almost 10 times more active than the un-substituted isatin [10]. Moreover, Isatin derivatives with position 5-substituted were more active over Isatin substituted at other positions and found to possess greater anti-cancer activity [11]. Thus, the starting material for creating prospective isatin derivatives was taken as 5-bromo Isatin. New substances based on proven Isatin scaffolds in combination with other pharmacophoric elements of drugs can be a right approach for the synthesis of new Isatin derivatives for prospective drugs. Study of N-Alkylated Isatin derivatives are found to have anticancer activity [12-14]. It was found that N-methylation greatly improved the cytotoxicity of the Isatin [10-11], SAR studies showed that an aromatic ring with a one or three carbon atom at position 1-N increased the anti-cancer activity [15-19]. Thus, considering the above facts and proven pharmacophoric properties of moiety such as ethyl pyrrolidine, ethyl piperidine di-methyl amino ethane and diethyl amino ethane, intermediate compound N-alkylated 5-bromo Isatin was prepared and used to create new Isatin derivatives with these moieties to investigate for various biodynamic activities such as antitumor, antibacterial and antifungal activities.

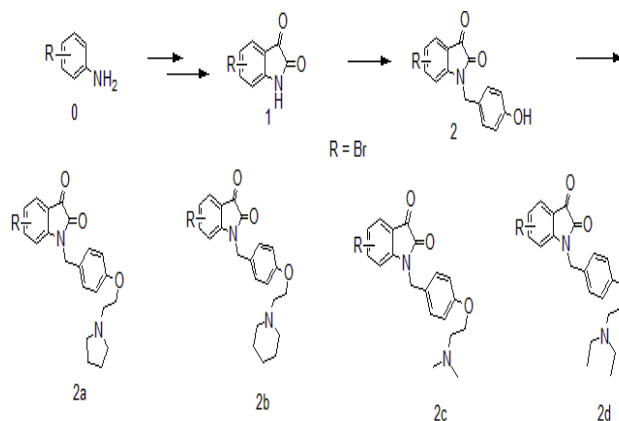
EXPERIMENTAL

Procedure for synthesizing the compounds for each step is described. The melting points were measured in open

capillaries "Toshniwal melting point apparatus". The Bruker Avans DRX 300 (300 MHz, FT NMR) spectrometer was used for recording ¹H NMR. The values of chemical shift are in ppm scale and coupling constants in Hz. Elemental analysis were done on analyser EA-1108 and were within +3-4% of theoretical values. For checking the purity of the products, pre-coated silica gel 60 F254 was used and the spots were visualized by using iodine vapors.

GENERAL PROCEDURE FOR SYNTHESIS OF COMPOUNDS

The prospective compounds which may have anti-tumor activities were synthesized using base compound 5-bromo Isatin (compound 1) outlined in Scheme-1. The compound 2 "N-(4-hydroxy phenyl methyl) 5-bromo indole-2,3-dione" was prepared after alkylation of compound 1 with p-hydroxy benzyl chloride. The set of compounds (2a -2d) were prepared by etherification of compound 2 with pyrrolidine-ethyl chloride, 2-(piperidyl) ethyl chloride, dimethyl-amino-ethyl chloride, dimethyl-amino-ethyl chloride at para position respectively. All the compounds were prepared as per given in Scheme 1.



Scheme-1: Synthesis of compounds (2a-2d)

Synthesis of N-(4-hydroxy phenyl methyl) 5-bromo indole-2,3-dione (2) Compound 2 was prepared by alkylation of 5-bromo Isatin with 4-hydroxy benzyl chloride. The solution of 5-bromo-isatin (4.42 mmol, 1 g) in acetonitrile (~70 mL), was added alumina/KF (40.7 mmol, 6.48 g) and the mixture was stirred for 5 min until brownish color is obtained. Then 4-hydroxy benzyl chloride (1.5 equiv., 6.6 mmol, 1.49 g) was added to the bottom flask after which the mixture was

refluxed under acetonitrile for 8-10 hours. The mixture was then cooled to room temperature and the suspended alumina/KF was filtered from the solution. Then, The filtrate was evaporated under reduced pressure to afford a solid that was recrystallized from hexanes/chloroform to afford the product. Synthesis of compound N-(4-(2-(pyrrolidyl) ethoxy) phenyl methyl) 5-bromo indole-2, 3-dione (2a – 2d) For synthesis of compound N-(4-(2-(pyrrolidyl) ethoxy) phenyl methyl) 5-bromo indole-2,3-dione (compound 2a), a mixture of of N-(4-hydroxy phenyl methyl) 5-bromo indole-2,3-dione (3 mmol, 1 g) (compound 2) and 2-(pyrrolidyl) ethyl chloride (9 mmol, 1.2 ml) and KOH (6mmol, 240mg, 2 pellet) was stirred for 16 hours. The other compounds (2b – 2d) were synthesized with the above procedure using the moieties 2-(piperidyl) ethyl chloride, dimethyl-amino-ethyl chloride, dimethyl-amino-ethyl chloride respectively.

Spectral data of selected compounds

N-(4-hydroxy phenyl methyl) 5-bromo indole-2,3-dione (2)
Yield 80%, MP 702K; ¹H NMR (200 MHz, CDCl₃): δ 6.60-6.61 (d, 2H, Ar-H, phenyl), δ 6.60-6.89 (d, 2H, Ar-H, phenyl), δ 4.00-4.22 (s, 2H, CH₂), δ 7.50 -7.72 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.30 -7.69 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.40 -7.96 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione); FAB-MS m/z 330, Anal Calcd for C₁₅H₁₀BrNO₃ (Mol Wt.332.15): C,54.24; H,3.03; Br,24.06; N,4.22; O, 14.45 Found: C,54.95; H,3.30; Br,24.67; N,4.78; O, 14.50

N-(4-(2-(pyrrolidyl) ethoxy) phenyl methyl) 5-bromo indole-2,3-dione (2a)

Yield 76%, MP 604 K; ¹H NMR (200 MHz, CDCl₃): δ 3.0 -4.04 (s, 2H, CH₂), δ 2.50 -2.78 (s, 2H, CH₂), δ 1.45 -1.59 (d, 4H, pyrrolidyl), δ 2.00 -2.25 (d, 4H, pyrrolidyl), δ 6.60-6.65(d, 2H, Ar-H, phenyl), δ 6.90-6.95(d, 2H, Ar-H, phenyl), δ 4.00-4.22(s, 2H, CH₂), δ 7.50 -7.72 (s, 1H, Ar-H, 5-bromo indole-2,3-dione), δ 7.30 -7.69 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.40 -7.96 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione); FAB-MS m/z 428, Anal Calcd for C₂₁H₂₁BrN₂O₃ (Mol Wt.429.31): C,58.75; H, 4.93; Br,18.61; N,6.53; O, 11.18 Found: C, 57.95; H, 4.40; Br,18.14; N,6.44; O, 10.95

N-(4-(2-(piperidyl) ethoxy) phenyl methyl) 5-bromo indole-2,3-dione (2b)

Yield 78%, MP 751.85 K; ¹H NMR (200 MHz, CDCl₃): δ 3.0 -4.04 (s, 2H, CH₂), δ 2.50 -2.78 (s, 2H, CH₂), δ 2.20-2.24 (d, 4H, piperidyl), δ 1.30 -1.50 (t, 6H, piperidyl), δ 6.60-6.65(d, 2H, Ar-H, phenyl), δ 6.85- 6.95(d, 2H, Ar-H, phenyl), δ 4.00-4.22(s, 2H, CH₂), δ 7.50 -7.72 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.30 -7.69 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.40 -7.96 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione); FAB-MS m/z 442, Anal Calcd for C₂₂H₂₃BrN₂O₃ (Mol Wt.443.33): C,59.60; H,5.23; Br,18.02; N,6.32; O, 10.83 Found: C,53.44; H,5.11; Br,18.01 N,6.21; O, 10.67

N-(4-(2-(dimethyl amino) ethoxy) phenyl methyl) 5-bromo indole-2,3-dione (2c)

Yield 76%, MP 702 K; ¹H NMR (200 MHz, CDCl₃): δ 3.0 -4.04 (s, 2H, CH₂), δ 2.50 -2.78 (s, 2H, CH₂), δ 2.50-2.27 (d, 6H dimethyl amino), δ 6.65(d,2H, Ar-H, phenyl), δ 6.95(d,2H, Ar-H, phenyl), δ 4.00-4.22(s, 2H, CH₂), δ 7.50 -7.72 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.30 -7.69

(s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.40 -7.96 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione); FAB-MS m/z 402, Anal Calcd for C₁₉H₁₉BrN₂O₃ (Mol Wt.403.27): C,56.59; H,4.75; Br,19.81; N,6.95; O, 11.90 Found: C,56 44; H,4.22; Br,19.22 N,6.21; O,11.67

N-(4-(2-(diethyl amino) ethoxy) phenyl methyl) 5-bromo indole-2,3-dione (2d)

Yield 79%, MP 725 K; ¹H NMR (200 MHz, CDCl₃): δ 3.0 -4.04 (s, 2H, CH₂), δ 2.50 -2.78 (s, 2H, CH₂), δ 2.50-2.40 (d, 4H, diethyl amino), δ 1.00 -1.00 (t, 6H, diethyl amino), δ 6.65(d,2H, Ar-H, phenyl), δ 6.95(d,2H, Ar-H, phenyl), δ 4.00-4.22(s, 2H, CH₂) δ 4.00-4.22(s, 2H, CH₂), δ 7.50 -7.72 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.30 -7.69 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione), δ 7.40 -7.96 (s, 1H, Ar-H, 5-bromo indole- 2,3-dione); FAB-MS m/z 430, Anal Calcd for C₂₁H₂₃BrN₂O₃ (Mol Wt.431.32): C,58.48; H,5.37; Br,18.53; N,6.49; O, 11.13 Found: C,58.44; H,5.11; Br,18.33 N,6.21; O, 11.67

RESULT AND DISCUSSION

The objective of the work was to design and synthesize potential Isatin derivatives based on the isatin scaffold in combination with other pharmacophoric moieties of proven drugs. For this, 5-bromo Isatins was used as starting material and further modified by alkylation with p-hydroxy benzyl chloride and then etherification of intermediate compound with pharmacophoric moieties for various biological activities.

Table-1 below shows the Isatin derivatives (2a-2d) evaluated for anti-tumor activity on cell lines MCF-7 and EVSA-T.

Compounds	MCF-7 (Cell No. *10 ⁴)	EVSA-T(Cell No. *10 ⁴)	Activity
2a	9.29±0.88	9.89±0.92	Positive
2b	8.95±0.67	8.55±0.62	Positive
2c	8.79±0.52	8.42±0.46	Positive
2d	9.29±0.88	9.89±0.92	Positive

Table 1: Anti-tumor activity on cell lines MCF-7 and EVSA-T

Below table shows the results of the Isatin derivatives (2a-2d) evaluated for anti-fungal activity

Anti-fungal activity @ 10 micro-gram/ml concentration				
Samples	A flavus Col. Dia. (mm)	%Inhibition	A niger Col. Dia. (mm)	%Inhibition
2a	0.7 ± 0.005	76.6	0.5 ± 0.003	75
2b	0.5 ± 0.003	83.3	0.4 ± 0.003	80
2c	0.2 ± 0.003	93.3	0.7 ± 0.003	65
2d	0.4 ± 0.004	86.7	0.6 ± 0.004	70

Table 2: Anti-fungal activity on A flavus and A niger

Below table shows the results of the Isatin derivatives (2a-2d) evaluated for

Anti-bacterial activity@ 10 microgram/ml concentration

Compounds	P. aeruginosa Dia. (mm)	S. aureus Dia. (mm)	K. pneumoniae Dia. (mm)
2a	++	+	++
2b	++	++	++
2c	++	++	++
2d	++	++	++

Table 3: Anti-bacterial activity on *P. aeruginosa*, *S. aureus* and *K. pneumoniae*

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anti-bacterial activity

- + Slightly active (diameter range 6-10 mm)
- ++ Moderately active (diameter range 10-14 mm)
- +++ Highly active (diameter range >14 mm)

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IN VITRO ANTIOXIDANT ACTIVITY OF METHANOLIC EXTRACTS OF CITRUS MAXIM L. FRUIT PULP, STEM AND LEAF.

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ABSTRACT:

Citrus maxima L. or pomelo, generally eaten as fresh fruit, is rich in vitamin C, phenolics, carotenoids and flavonoids, the potential antioxidants. In order to assess its antioxidant activity, the leaves, stems and fruits were collected washed with water, air dried in shade, ground to a fine powder, and methanolic extracts were prepared by using Soxhlet apparatus. The free radical scavenging activities of the extracts were determined by DPPH assay. The results obtained in the form of IC₅₀ values for DPPH radical scavenging activity were 457.2, 859.8 and 876.69 µg/ml respectively for leaves, fruits and stem portions, indicating higher anti-oxidant activity in the leaves.

Keywords: Antioxidant, DPPH, IC₅₀, scavenging activity.

Introduction:

Oxygen atoms are capable of damaging molecules and are called as free radicals. In order to control this free radical formation Antioxidants are needed. Natural antioxidants are effective to prevent destruction process caused due to free radicals. Among these antioxidants, flavonoids and phenolics are reported to have powerful anti-oxidant properties use of plant secondary metabolites for natural antioxidants has gained importance in recent years because of the increasing awareness of herbal remedies.

Materials and Methods:

The aerial parts (leaves, stems and fruits) of *Citrus maxima* were collected from Bangalore. The collected plant material was washed under running tap water followed by washing with distilled water for five minutes. The plant material was air dried in the shade and ground to a fine powder. About 500 g of the plant material was successively extracted with methanol in a Soxhlet apparatus. The methanol extract was then evaporated under reduced pressure to get the crude extract which was lyophilized into a paste and used for further analysis.

The radical scavenging activity of different extracts was determined by using DPPH assay according to Chang et al (2001).

Results & Discussion :

Table 1: DPPH radical scavenging activity of the methanol extracts of the leaves, fruit and stems of *Citrus maxima* compared with ascorbic acid.

Concentration	Ascorbic acid (Standard)		Citrus maxima Leaves		Citrus maxima Fruit		Citrus maxima Stem	
	Absorbance	Percentage of inhibition	Absorbance	Percentage of inhibition	Absorbance	Percentage of inhibition	Absorbance	Percentage of inhibition
Control	1.7983		1.324		1.324		1.324	
12.5	1.4044	21.9	0.9705	26.7	0.9505	28.21	1.0128	23.5
25	1.0782	40.04	0.9438	28.72	0.9439	28.71	0.9765	26.25
50	0.7121	60.4	0.9172	30.73	0.9329	29.54	0.9645	27.15
100	0.2921	83.75	0.8536	35.53	0.9196	30.54	0.952	28.1
200	0.0692	96.15	0.8464	36.07	0.8852	33.14	0.9253	30.11
IC50 Value	Calculated using ED50 PLUS V1.0 Software				859.858 µg/mL		876.69 µg/mL	

Table 1 shows DPPH radical scavenging activity of the methanol extracts of the leaves, fruit and stems of *Citrus maxima*. It was observed that methanol extracts of the leaves of *C. maxima* had higher activity (457.239 µg/mL) than that of the stem (876.69 µg/mL) and fruit (859.858 µg/mL). The effect of antioxidants on DPPH is thought to be due to their hydrogen donating ability. Though the DPPH radical scavenging abilities of the extracts were less than those of ascorbic acid (96.15%) at 200 µg/mL, this study showed that the extracts have the proton-donating ability which could possibly serve as free radical inhibitors or scavengers, acting as primary antioxidants.

On the basis of observations and results obtained it is concluded that *Citrus maxima* is good source of antioxidants. As

compared to leaves, stems and fruits, leaves show higher antioxidants activity than the others parts.

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