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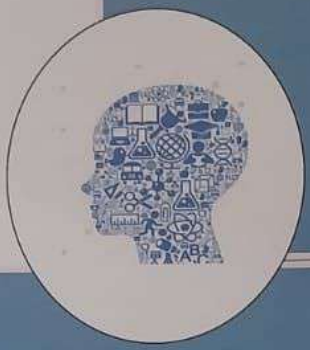

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The Impact of Artificial Intelligence on Cybersecurity Measures

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ABSTRACT

The rapid evolution of cyber threats in today's digital landscape has necessitated innovative approaches to cybersecurity. In response to this challenge, Artificial Intelligence (AI) has emerged as a transformative force, revolutionizing how organizations defend against cyber- attacks. This paper explores the multifaceted impact of AI on cybersecurity measures. It examines the integration of AI technologies, such as machine learning, natural language processing, and predictive analytics, into cybersecurity frameworks to detect, prevent, and mitigate threats. Through real-world case studies and emerging trends analysis, this paper provides insights into the transformative potential of AI in fortifying digital defences against cyber threats. Additionally, it addresses the challenges and ethical considerations associated with AI-driven cybersecurity solutions. By harnessing the power of AI, cybersecurity professionals can proactively identify and neutralize threats, staying ahead of adversaries in theever-evolving cyber landscape.

KEYWORDS

Artificial Intelligence (AI); Cybersecurity; Threat Detection; Behavioural Analysis

INTRODUCTION

In recent years, the proliferation of Artificial Intelligence (AI) technologies has significantly transformed various industries, revolutionizing the way tasks are performed and insights are derived. One domain where AI's impact is particularly profound is cybersecurity. As organizations increasingly rely on digital infrastructure to store, process, and transmit sensitive data, safeguarding against cyber threats has become a paramount concern. In response to the evolving nature of cyber threats, AI has emerged as a powerful tool for enhancing cybersecuritymeasures.

This paper explores the multifaceted impact of AI on cybersecurity measures. It delves into how AI technologies, including machine learning, natural language processing, and predictive analytics, are being leveraged to detect, prevent, and mitigate cyber threats. Furthermore, it examines the challenges and ethical considerations associated with the integration of AI into cybersecurity frameworks.

The intersection of AI and cybersecurity presents a dynamic landscape, where traditional security approaches are being augmented and, in some cases, supplanted by AI-driven solutions. By analysing real-world case studies and emerging trends, this paper aims to provide insights into the transformative potential of AI in fortifying digital defences against cyber threats.

As organizations grapple with the escalating sophistication and frequency of cyber-attacks, understanding the role of AI in cybersecurity is essential for devising effective defines strategies. By harnessing the power of AI, cybersecurity professionals can stay one step ahead of adversaries, proactively identifying and neutralizing threats before they manifest intobreaches.

In the subsequent sections, we will delve deeper into the specific applications of AI in cybersecurity, explore the underlying mechanisms driving these innovations, and assess the implications for the future of digital security.

AI-POWERED THREAT DETECTION

1. Introduction to AI-Powered Threat Detection:

- Define AI-powered threat detection and its importance in modern cybersecurity.

- Briefly discuss the limitations of traditional threat detection methods and the need for AI- driven approaches.

2. Machine Learning Algorithms for Threat Detection:

- Explore various machine learning algorithms used for threat detection, such as supervised learning (e.g., support vector machines, decision trees), unsupervised learning (e.g., clustering, anomaly detection), and semi-supervised learning.

- Provide examples of how these algorithms are applied to analyse network traffic, endpoint behaviour, and other security data sources to identify potential threats.

3. Deep Learning in Threat Detection:

-Discuss the role of deep learning techniques, such as convolutional neural networks (CNNs) and recurrent neural networks (RNNs), in cybersecurity.

- Highlight applications of deep learning in image-based threat detection (e.g., malware classification), natural language processing (e.g., detecting phishing emails), and time-series analysis (e.g., detecting advanced persistent threats).

4. Behavioural Analysis and Anomaly Detection:

- Explain how AI-powered systems use behavioural analysis and anomaly detection techniques to identify deviations from normal user behaviour and network activity.

- Discuss the advantages of behavioural analysis over signature-based approaches in detecting zero-day attacks and insider threats.

5. Threat Intelligence and AI:

- Explore how AI is used to analyse and leverage threat intelligence feeds from varioussources, such as cybersecurity vendors, open-source communities, and government agencies.

-Discuss the role of AI in aggregating, correlating, and prioritizing threat intelligence data toenhance threat detection and response capabilities.

BEHAVIOURAL ANALYSIS AND ANOMALY DETECTION

1. Introduction to Behavioural Analysis and Anomaly Detection:

- Define behavioural analysis and anomaly detection in the context of cybersecurity.

-Explain why traditional signature-based methods are inadequate for detecting sophisticatedcyber threats, necessitating the use of behavioural analysis and anomaly detection.

2. Principles of Behavioural Analysis:

- Describe how behavioural analysis leverages AI and machine learning techniques toestablish a baseline of normal behaviour for users, devices, and networks.

-Discuss the importance of contextual understanding and continuous learning in behaviouralanalysis to adapt to evolving threats.

3. Types of Behavioural Anomalies:

- Outline different types of behavioural anomalies, including deviations from establishedbaselines, unusual access patterns, and suspicious user activities.

- Provide examples of behavioural anomalies in network traffic, endpoint behaviour, and application usage.

4. Machine Learning Models for Behavioural Analysis:

-Explore various machine learning models used for behavioural analysis, such as clustering algorithms, hidden Markov models (HMMs), and recurrent neural networks (RNNs).

- Discuss the advantages of supervised, unsupervised, and semi-supervised learningapproaches in detecting behavioural anomalies.

5. Real-time Monitoring and Detection:

-Explain how AI-powered systems enable real-time monitoring and detection of behaviouralanomalies across diverse data sources, including logs, packets, and sensor data.

- Highlight the importance of automated response mechanisms to mitigate risks associatedwith detected anomalies.

PREDICTIVE ANALYTICS FOR RISK ASSESSMENT

1. Introduction to Predictive Analytics for Risk Assessment:

- Define predictive analytics in the context of cybersecurity and its role in assessing andmitigating cyber risks.

-Discuss the limitations of reactive approaches to cybersecurity and the need for predictive capabilities to anticipate and prevent threats.

2. Data Sources and Features:

-Identify the diverse data sources used in predictive analytics for risk assessment, including historical security data, threat intelligence feeds, network telemetry, and external factors (e.g., geopolitical events, industry trends).

-Discuss the importance of feature engineering and data preprocessing in extracting relevant features for predictive modelling.

3. Machine Learning Models for Risk Prediction:

-Explore various machine learning models used for risk prediction in cybersecurity, such as logistic regression, random forests, gradient boosting machines, and deep learningarchitectures.

-Highlight the strengths and limitations of different models in handling imbalanced datasets, capturing nonlinear relationships, and providing interpretable results.

4. Feature Selection and Importance:

-Discuss techniques for feature selection and importance estimation in predictive analytics, such as information gain, recursive feature elimination, and permutation importance.

- Illustrate the importance of domain knowledge and expert input in identifying relevant features for risk assessment.

5. Risk Scoring and Prioritization:

- Explain how predictive analytics generates risk scores and prioritizes security incidents based on their likelihood and potential impact.

- Discuss the use of risk heat maps and risk matrices to visualize and communicate risk assessment results to stakeholders.

ADAPTIVE SECURITY ARCHITECTURES

1. Introduction to Adaptive Security Architectures:

-Define adaptive security architectures and their significance in addressing the dynamic and evolving nature of cyber threats.

- Discuss the limitations of traditional, static security architectures in adapting to new and sophisticated attack vectors.

2. Principles of Adaptive Security:

-Explain the core principles underlying adaptive security architectures, such as continuous monitoring, contextual awareness, and dynamic response.

- Highlight the importance of flexibility, scalability, and automation in adaptive security frameworks.

3. Machine Learning and AI in Adaptive Security:

- Explore how machine learning and artificial intelligence technologies are leveraged in adaptive security architectures.

- Discuss the role of AI in analysing vast amounts of security data, detecting patterns and anomalies, and making real-time decisions to adapt security measures.

4. Behavioural Profiling and User Context:

- Explain how adaptive security architectures use behavioural profiling and user context to establish baselines of normal behaviour and detect deviations indicative of security threats.

-Discuss the use of AI-driven algorithms to analyse user behaviour across various endpoints and access points to identify potential insider threats or compromised accounts.

5. Dynamic Threat Response and Remediation:

- Describe how adaptive security architectures enable dynamic threat response and remediation actions based on the severity and context of security incidents.

-Discuss the role of AI in orchestrating automated responses, such as isolating compromised systems, updating access controls, or deploying patches in real-time.

CHALLENGES AND LIMITATIONS OF AI IN CYBERSECURITY

1. Data Quality and Availability:

- AI algorithms heavily rely on high-quality, labelled data for training and validation. However, obtaining labelled cybersecurity data can be challenging due to privacy concerns, data silos, and limited access to relevant datasets.

- Additionally, the quality and diversity of available data may vary across different cybersecurity domains, posing challenges for developing robust and generalizable AI models.

2. Adversarial Attacks:

- Adversarial attacks exploit vulnerabilities in AI models by injecting carefully crafted inputs designed to deceive or mislead the algorithms. In the context of cybersecurity, adversaries may attempt to evade detection or manipulate AI-based security systems through adversarial techniques.

- Mitigating adversarial attacks requires robust defines mechanisms, such as adversarial training, input sanitization, and model verification techniques, to enhance the resilience of AI- driven cybersecurity solutions.

3. Algorithmic Bias and Fairness:

-AI algorithms are susceptible to bias, which can lead to unfair or discriminatory outcomes, particularly in sensitive domains like cybersecurity. Biases in training data, algorithmic design, and decision-making processes may disproportionately impact certain groups or lead to inaccurate predictions.

- Ensuring fairness and transparency in AI-driven cybersecurity solutions requires careful consideration of bias mitigation techniques, such as data preprocessing, algorithmic auditing, and diversity-aware model training.

4. Interpretability and Explain ability:

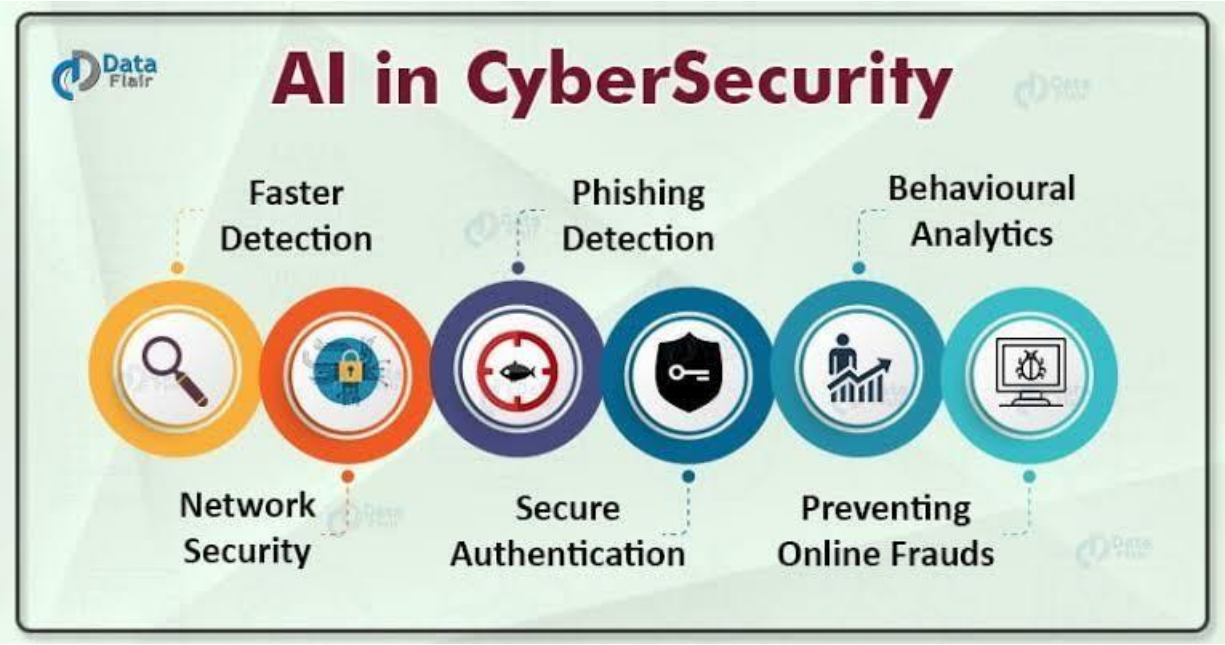
- The black-box nature of many AI algorithms presents challenges for interpreting and explaining their decisions, especially in critical applications like cybersecurity where accountability and trust are paramount.

- Addressing the lack of interpretability and explain ability in AI models involves developing techniques for model introspection, feature attribution, and generating human-readable explanations of algorithmic outputs.

5. Scalability and Resource Constraints:

- AI-driven cybersecurity solutions often require significant computational resources, storage capacity, and bandwidth to process large volumes of data and perform complex analyses in real-time.

- Scalability concerns may arise when deploying AI models in resource-constrained environments, such as edge devices, IoT networks, or cloud environments with limitedcomputing resources.



CONCLUSION

In conclusion, the impact of artificial intelligence on cybersecurity measures is profound and multifaceted. AI technologies offer both opportunities and challenges in defending against cyber threats. While AI-driven cybersecurity tools enhance detection capabilities, automate responses, and bolster defines mechanisms, they also introduce new vulnerabilities and raise

concerns about adversarial attacks. The future of cybersecurity will depend on a strategic balance between harnessing the power of AI to strengthen defences and addressing the evolving threats it presents through robust governance, collaboration, and innovation.

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These references cover various aspects of the impact of artificial intelligence on cybersecurity, including threat detection, anomaly detection, machine learning techniques, and comprehensive surveys of the field.

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RIZVI EDUCATION SOCIETY'S RIZVI COLLEGE OF ARTS, SCIENCE & COMMERCE

Janvi Prajapat
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Gender Representation in Greek Mythology and Folktales: *Examining the Contemporary Re-Visualization of Mythologies from the Perspective of the Marginalized Other.*

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Abstract

Folktales and Mythological narratives are a few of the oldest forms of storytelling and they have been celebrated by readers for centuries. It is known that they do not have single authors and that Folktales continue developing and their narratives continue shifting with every author or storyteller who decides to take on the task of ensuring that these tales continue to survive with humankind. Within the context of Folk and Mythological studies, Gender has been a dynamic force that shapes the narrative due to the contextual connotations attached to the concepts of femininity and masculinity, specifically pertaining to the Old Ages. The ideas about the 'ideal woman' or the 'heroic male' can be traced throughout the literary canon and contemporary critics have started questioning the role of gender in these tales. There has been a contemporary resurgence of folktales wherein the established canon of folk literature is being addressed by a younger generation of writers who are keen to question the traditional forced gender performative patterns that can be observed in folklores. This paper aims to examine the contemporary retelling of Greek Mythologies from the perspective of the marginalized other and assess how these retellings are utilized in order to visualize the tales that existed only in oral forms in the past. The paper examines the various contemporary retellings of Greek Myths including Circe and The Song of Achilles by Madeline Miller, Everything Under by Daisy Johnson, The Silence of the Girls by Pat Barker, and The Penelopiad by Margaret Atwood. The paper also studies how social class impacts the overall treatment of the othered gender by examining Kiran Millwood Hargrave's The Mercies. The paper performs secondary research and evaluates the critical feminist approach of contemporary writers as they rewrite historical lore. The results of the contemporary retellings of ancient narratives have created a subculture of questioning ethically questionable acts that are often performed by the people in power.

Keywords: *Greek Mythology, Gender Performativity, Folklores, Witchcraft, Retellings, Masculinity.*

Introduction:

Fairytales, folklore, Folktales, and Mythological tales have historically been celebrated because of the importance that they hold within the society. They hold such enormous importance because stories find their home in the memories of people and when everything in the world is destroyed, when all the science and archeology has failed humankind, literature is the only vessel that is able to carry these memories. All the knowledge of humankind is essentially based on the memories that the mind holds, the memories that have been passed down from generation to generation through plain word of mouth. All of our childhood memories have their roots in the tales told to us by our grandparents and these memories essentially shape the entire course of our lives as they carve our moral, ethical, and societal values (Sone, 2018).

However, contemporary critics and writers have come to an understanding that the cannon of folk literature is essentially consumed with patriarchal ideals, abuse of the female body, usage of the female body as the site of destruction, the objectification of women, the idea of conquering the 'motherland', the concept of gender performativity, and glorification of toxic masculinity. In the folktales, the males are often portrayed as courageous beings who possess inherent power, sometimes even over death and women become their inferior counterparts who remain silent, often sobbing and entirely vulnerable objects to the male subject (Florence, 2013). Writers like Margaret Atwood, Natalie Hayes, Madeline Miller and many more have tried to challenge these prominent thematic impressions in literature by consciously creating narratives within which the previously colonized female bodies metaphorically and literally fight off their male colonizers through the utilization of their physical as well as mental prowess.

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The Contemporary De-Mythification of the Female Body

Madeline Miller's Circe (Miller, 2018) undertakes the process of retelling Homer's The Odyssey from the perspective of Circe, the nymph who was targeted in Homer's original stories (Chwast and Homer, 2012). This book is told from the perspective of Circe and the readers are able to witness her journey from a young, innocent, abandoned, and often bullied child to a powerful nymph who realizes that the world was ruled by emotionally shallow yet politically powerful men who would go to unimaginable lengths to conquer over the female mind and body. While in Homer's narrative Circe is depicted as a ruthless witch whose only ambition in life is to show cruelty towards warriors and turn them into pigs, while forcing them to perform adultery by bewitching them, Miller depicts Circe as a vulnerable child who was forcefully exiled from her motherland by her own people because they were scared of her powers along with being disgusted with the fact that she was not as beautiful as the other nymphs. With the incorporation of this theme, Miller also wants to point out the human (as well as godly) need to force the female body to exist in a certain manner that can be utilized to appease the superior sex as this becomes the only thing that defines the usefulness of her existence. Miller's Circe is the study of the betrayals that women have to suffer at the hands of patriarchy and feminine persistence in the face of abandonment and forced exile.

Similarly, authors like Pat Barker are consciously working to reshape the established narratives by giving agency to the constantly othered female characters who were either the root of wars or the victims of brutal atrocities in the traditional literary canon. Pat Barker's The Silence of the Girls (Barker, 2018) becomes another such book that takes on the task of documenting the experiences of the marginalized women who were brutally enslaved during the Trojan War. This vulnerable yet striking courage of the women of Troy could be heard in the statement 'We're going to survive–our songs, our stories. They'll never be able to forget us. Decades after the last man who fought at Troy is dead, their sons will remember the songs their Trojan mothers sang to them. We'll be in their dreams–and in their worst nightmares too' (Barker, 2018). The story is told from the perspective of Briseis, the childless wife of Mynes. Historically, Briseis (or, Hippodameia) has been treated as an ornament to be adorned by the 'warriors' as can be seen in Homer's Iliad (Homer and Green, 2016) wherein she represents the political and societal status that is sought after by both Achilles and Agamemnon. Throughout the epic, Homer treats her as he treats his other marginalized female characters, by constantly alluding to their beauty and trying to justify the crimes committed against them by the warriors and reason how the actual culprit was the beauty of the female characters. An ideology that is echoed by Fitzgerald's Daisy Buchanan who exclaims that she wishes her daughter to be 'a fool, a beautiful fool' when she grows up (Fitzgerald, 2013). This remark is obviously a sarcastic take on the societal idea that first and foremost, women must exist as beautiful accessories and secondly that if they are not foolish enough to blindly follow the rules and regulations provided by the patriarchal society, their entire identities will be mutilated.

The Socio-Cultural aspect of the Modern Retellings of Classical Myths and Folktales

Margaret Atwood's The Penelopiad becomes another modern retelling of a Greek epic wherein the abused female voices guide the narrative and question the acts of the powerful men as well as women of that society (Atwood, 2005). In this modern retelling of Homer's, The Odyssey, the twelve maids of Penelope continuously interrupt the narrative to present their own subaltern point of view. The narrative is filled with the guilt that the maids feel about not killing Telemachus when he was younger as they were aware that he would end up brutally killing them when he grows up and constantly questioning the actions of the royal family. In one such chorus, the maids sing, 'we are the maids, the ones you killed, the ones you failed, we danced in air, our bare feet twitched, it was not fair' (Atwood, 2005). The Penelopiad, thus, becomes a daunting critic of patriarchy as well as classism and societal hierarchy which is defined by the financial or social status of individuals. Atwood shows the plight of the women who are forced to live at the periphery of society because of their social class. Atwood examines the difference between women who live within the privileged section of society and the women who essentially have to work for them to present a deep study on the differences in the abuses that are performed on women who exist at the opposing ends of the capitalist society. While Penelope is deserted by her husband and has to remain 'pious' as she is deemed to be by not entertaining any male suitors while her castle floods with them, the maids are brutally murdered, or, silenced by the end of the story for trying to speak against the crimes that are being committed against them. Another thing that must be noticed is that because Penelope is a woman who enjoys social privilege, she is able to exercise individuality throughout the narrative, to the point where the tale is named after her whereas the 'maids', remain a plural object, an object which is not allowed any form of singularity. Further, they are not even given any names to showcase the absolute hollowness of the upper-class population who cannot be bothered to memorize the names of the people who work for them so they must be clubbed together into one single entity.

Madeline Miller's The Song of Achilles is another novel that takes up the Homeric myths that surrounded the relationship between the Greek hero Achilles and his companion Patroclus (Miller, 2011). Miller counterattacks the historical belief that these two warriors were simply friends. She presents the tale

of Achilles and Patroclus as a forbidden tale of love that has been, historically, sanitized and erased to a certain point to serve the social perception of heterosexuality and homosexuality. The story is told from the perspective of Patroclus, a character who can provide an in-depth analysis of the inherent powerlessness of female existence within ancient Greek society. Even though Miller can depict certain points of female agency within the society, it must be understood that, the idea of women exercising power within the ancient patriarchal society was nothing less than an illusion. The powerless tales of the Greek women run parallelly with the fragile love that exists between two men. While Achilles and Patroclus are not able to emotionally comprehend the depth of their love because they have been trained by society to indulge in acts of gender performativity and toxic masculinity which requires them to be ruthless towards other human beings, the women of the novel constantly battle sexual assault (Thetis), forced intellectual disability (Patroclus's Mother), abduction (Helen), slavery (Brises), being turned into religious sacrificial offerings (Iphigenia) and much more. Daisy Johnson goes beyond the construct of heterosexuality with her Everything Under, a retelling of Oedipus Rex, written by Sophocles (Johnson, 2019). In her retelling, Johnson tackles the concept of gender performativity (Meyerhoff, 2014) and the contemporary location of a transgender individual by adapting the character of the blind prophet of Apollo, Tiresias who is represented in this book as Fiona. Fiona is assigned the biological gender of a man when she is born but eventually, she comes to the realization that this is not who she is. Johnson's Fiona is someone who has had an estranged relationship with her family because of her sexual identity and has to leave her home to become who she really is. In this process, she ends up being abused multiple times along with experiencing almost no financial security and stable housing because of the emotional and mental agonies that accompany the act of shredding the socially imposed identity of an individual in order to become who they truly are. Marcus, another character in the novel, who ends up becoming a modern version of Oedipus has to go through a tumultuous gender change as he has to leave his house because of the prophecy of Fiona and realizes that he cannot stay alive in the brutal world out there if he exists as the girl that he initially used to be. This novel, along with showing the emotional and physical traumas of belonging to the LGBTQI+ community, also shows the experience of the individuals who belong to this community on a socio-cultural level.

The Mercies by Kiran Millwood Hargrave is one such book that attempts to break the accepted narrative surrounding witchcraft as it is written from the perspective of the women who were massacred by the people in power who were afraid of the intellect and the inherent power of women who managed to survive in a village where men did not exist (Hargrave, 2020). The Mercies portrays a town where adversity strikes and all of the men of the town are killed, the women, then, have to assume the responsibility of feeding their families. But people from nearby towns start questioning the existence of a geographical landscape where men are not the rulers and claim that the women residing in this town must be performing acts of witchcraft. This is, historically, one of the most prevalent beliefs all over the world. Even in contemporary post-colonial nations, women are simply termed witches if they are able to thrive independently or if anything out of the ordinary happens with the men in their lives. A study conducted in 2020 shows how within the Indian Caste system, Dalit women faced triple discrimination which is based on gender, class, and caste. One of the most common attacks that are hailed at them is the accusations of practicing witchcraft (Yadav, 2020). Most of the female characters of Hargrave's novel die a horrendous death, some of them are burned on a stake and those who refuse to surrender are forced into the water the claims are made that if the woman is able to swim then she is indeed a witch and must be burned on a stake and if she does drown, that means that the almighty must have punished her for her sins. This claim shows the hypocritical ideologies that are practiced against female existence wherein no matter what women do, they end up being brutally assaulted for being able to exist without a male presence. Gayatri Chakravorty Spivak's essay, 'Can the Subaltern Speak?' examines the cultural existence of the subaltern Indian woman in a post-colonial, post-truth world wherein she is not allowed to even have a voice that belongs to her (Riach, 2017). However, it must be understood that these modern retellings allow the readers as well as the writers to perceive a future where the traumas of the marginalized others will finally be understood and documented. These rewritings of ancient myths show that the contemporary generation of writers demands justice for all the characters and individuals who were wronged historically because of the glorification of the classic patriarchal folklore and myths.

Conclusion

In summation, it can be stated that contemporary writers are consciously engaging in re-writing the Folk narratives through the perspective of the marginalized others. The fundamental idea of this research paper, thus, states that the literary canon and its celebration needs to be questioned, kept under scrutiny, and should be looked at from a more emphatic and contemporary point of view which is able to sympathize with the characters who have been historically wrong. The content of this research proves that the modern wave of retellings of narrative has created a subculture of questioning ethically questionable acts that are often performed by the people in power.

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17. Study on Measuring E - Service Quality of Goibibo Online Ticket Booking among users of Mumbai Region

Dr. Masooma Zaheer Asad Sayed
Rizvi College of Arts Science and Commerce, Bandra East.

Abstract

Online ticket booking application have been booming in India since the past decade. it is medium that provides its users with various e-services towards booking hotels, air, bus, train tickets online with ease. The purpose of this study is to measure the e-service quality of Goibibo. The technique used for the current study is parametric paired t-test. It is found that Goibibo lacks in fulfilling its promises made to the customers and does not give a prompt and quick reply to the customers. Further studies can be made building a structural equation model evaluating impact of e-service quality of Goibibo application on users' overall satisfaction and loyalty.

Keywords: *e-service quality, e-ticketing, user satisfaction.*

Introduction

Ibibo Group was formed in 2007 om Gurugram, Haryana, by Ashish Kashyap to provide social networking services and later changed to an e-commerce and travel organisation, making online travel booking easier and beneficial to the public. Goibibo was introduced in 2009 and is part of the Ibibo group, some became the most extensive hotel assemblage and are one of India's few ruling air clusters. Vikalp Sahni and Sanjay Bhasin co-founded Goibibo. Goibibo is a dominant online travel booking label that provides many choices for hotels, trains, buses, and flights for commuters. The company takes pride in stating that it focuses on providing the most dependable customer experience, providing quick search and booking facilities, prompt payments, reimbursement and settlement procedures. Goibibo has seen tremendous growth since its inception when it started with fewer members; by 2012, the number of working people had grown to 25 members. The application was updated by adding rescheduling online and international flights. The same year, the company started offering bus ticket booking services and acquired RedBus. In the later years, it kept on adding various features to its systems, such as Gocash, a digital wallet which gives the customer instant reimbursement at times of

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cancellations and quick another booking, it aids users towards flight, hotels and bus booking. The Goibibo team has been tirelessly working towards improving the network, helping the customers towards smooth booking facilities, and working with the business attached to the Goibibo platform to provide superior service for the users. Goibibo marched with MakeMyTrip 2016, another online travel booking giant, and together they have been doing wonders in the online travelling sector. They have worked towards various aspects that needed their complete focus.

E-Service quality have been measured using five dimensions; Application /website design refers to the way the application or the website is designed whether it is appealing to the eyes of its user's, whether is easily downloaded or loads quickly while browsing all these aspects define the e-service quality of the service provider. Reliability refers to the organisation's potential and never failing to perform a service that satisfies the customer's needs. Responsiveness is the firm's aptness to aid its customers in terms of instant replies towards the issues and queries a customer may have about the product or any other service. Security is one of the most important aspects for any service provider applications and webpages, the application should be safe from hacking and the personal data of the user is safe and secure also it is important that the bank details provided during the transactions are safe with the application and is secure from cyber theft. Ease to use is another important aspect which the customer looks at while browsing the application which is that it is easy to use, provides various language options to select from and provides and fun and games on the application so that there is a level of entertainment and benefits available while using the application.

Our study focuses on finding out the e-service quality of Goibibo and understanding the factors that define the company's e-service quality and study will help to give suggestive measures for improving the quality of services provided by Goibibo.

Review of Literature

1. **Avhad, T., & Anute, N. (2021).** The research is regarding and study of various digital marketing strategies. It examines how these strategies impact their business. The objective is also to understand the nation's growth and opportunities for online tourism. Tourism has grown massively in the present times and is affected highly by technology. There is wide competition, and the customer gives preference to that who offers the

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best facilities. Goibibo is very careful in developing newer campaigns for customer attraction.

2. **Chaddha, P. et al. (2021)** The paper analysed the effect of celebrity endorsements on consumer purchase intention in the Indian travel industry. The author believes that it is an ongoing trend that various travel companies go towards promoting tourism with the help of a known face or a celebrity. The paper was shortlisted using a non-random convenience sampling method, with 322 respondents from Delhi -NCR. The study results showed that various online travel services such as Goibibo, Make My Trip, Yatra, and Trip advisors use celebrities to attract travellers as they build attractiveness, expertise, trustworthiness, respect and similarity.

3. **Chauhan, S. K. (2019).** The author examined the purchase intention and customer satisfaction towards online travel agencies. Online travel services have been in India since 2009, it has been more than a decade since this industry was introduced in the country, and it has been soaring since then. The paper further elaborates on various online travel agencies such as Make MY Trip, Travel Guru, Cleartrip, and Goibibo. It states that the feedback and reviews of the customers of Goibibo have been mostly positive and that the company provides a lot of exciting deals and has one of the most significant clusters of destinations and hotels.

4. **David, A. et al. (2019).** The paper investigated digital homestay strategies in Ernakulum District, Kerala. The authors believe that the tourism industry plays a crucial role in the development of any place, and using digital techniques increases the chance of better stories of tourist places. Homestays are said to be the firm foundation of Kerala tourism. It was found that online hotel booking portals play an essential role in being ambitious in the homestay industry. The paper tested the service quality strategies and their association towards e-service satisfaction. It was observed that social media, such as Facebook, was the most effective marketing strategy, whereas email marketing and blogs were less popular.

5. **Kavitha, C. et al. (2020)** The authors conducted this research to identify customer-perceived website quality of online booking channels. The paper further states that with the change and development brought about by the introduction of the Online travel ticket booking sector, a significant revolution was seen in the travel booking sector.

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The research has conducted a study on 522 customers of the online travel booking sector, and it was observed that the perceived attractiveness and detailed classification are vital in regulating the website's standard.

6. **Singh, G. et al. (2021)** The authors studied the tourism and online booking system of hotels and guides. India has seen an increase in online tourism for a decade. The country is coming out of the traditional form of booking and is rushing towards online booking facilities for travel. The authors believe that people are now travelling within the country to wildlife centuries, beaches, yoga retreats, luxury hotels, etc., and this online booking system is helping them plan their journeys with much stress. The online booking system done via trusted websites is risk-free and safe and has a lot of benefits towards future travel plans.

7. **Sucharitha, R. et al. (2022)** The authors conducted a study on the impact of service quality and customer satisfaction towards online travel agencies. The number of people travelling in India and with the frequency of their travels is growing steadily. The study was conducted on 300 regular travellers using a survey designed specifically for them and was analysed using the SPSS software. The authors concluded the study by stating that service quality improvement will help maintain and retain consumers and will grant their loyalty towards the brand. The perceived service qualities for all the dimensions, like tangibility, reliability, responsiveness, assurance and empathy, are different from the level of expectation of travel consumers.

Objective of the Study

1. To examine the e- service quality of Goibibo online ticket booking company.
2. To give suitable suggestions to improve the e- service quality of Goibibo.

Hypothesis

Ho: There is no significant difference in the expected and perceived mean score.

H1: There is a significant difference in the expected and perceived mean score.

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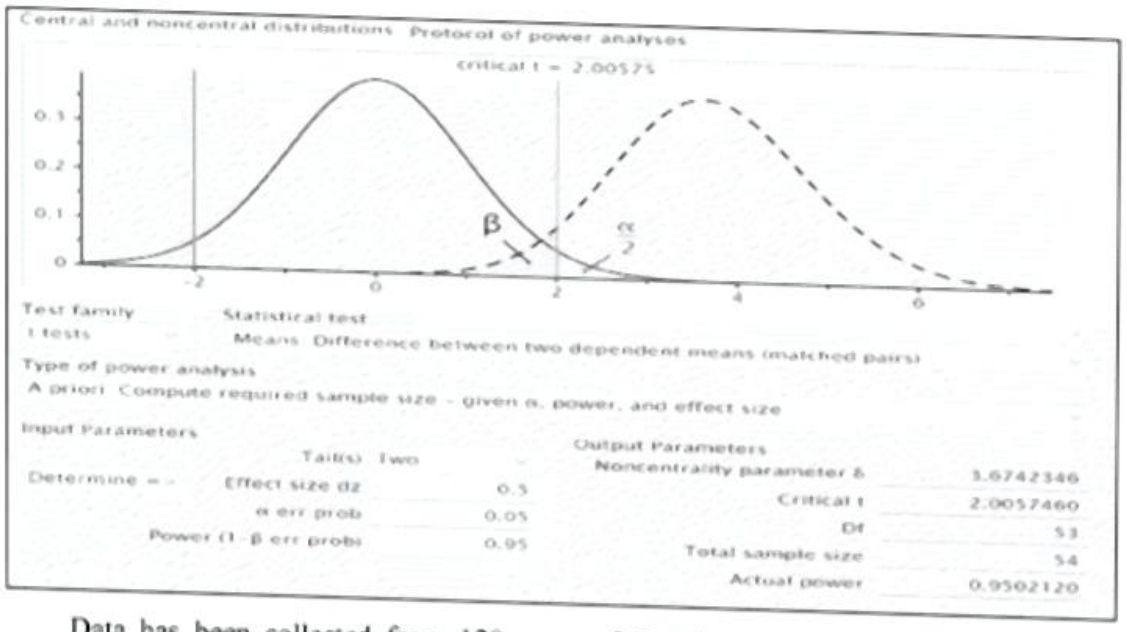
Research Methodology



Data has been collected from 120 users of Goibibo application using google forms. (minimum sample required at 0.5 effect size, Alpha of 5% and power of test 95% to apply paired t test =54) Non-probability convenience sampling technique was used for the current study. Both primary and secondary data collection technique have been used for the current study. SPSS 26 have been used for the current study and the technique applied for the analysis is paired t –test.

Data Analysis and Interpretation

Table No. 01: Reliability Analysis

Construct	Expected	Perceived
Application Design/website	.878	.944
Reliability	.700	.788
Responsiveness	.822	.711
Security	.777	.922
Ease of use	.844	.800

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Table No. 2: Gap Analysis- Application Design/Website.

	Expected		Actual		GAP	p-Value
Items	Mean	SD	Mean	SD	(Perceive d Mean Expected Mean)	0 000
The goibibo website is visually appealing.	2.3600	80	3.8700	.77	1.51	0 000
Goibibo application is easy to download.	4.5400	88	4.9800	88	0.35	0 000
The goibibo website and application pages load quickly while surfing.	2.9000	.67	3.8700	.79	0.97	0 000

Table No. 3: Gap Analysis- Reliability

	Expected		Actual		GAP	p-Value
Items	Mean	SD	Mean	SD	(Perceive d Mean Expected Mean)	
Goibibo advertisement is true and accurate.	2.7900	.67	3.9900	.58	1.2	0.000
Goibibo services are reliable and dependable.	4.8000	.76	4.4000	.70	1.20	0.000
Goibibo fulfil promises made to customer.	3.80	.68	2.30	.75	(1.50)	0.000

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Table No. 4: Gap Analysis- Responsiveness.

	Expected		Actual		GAP	p-Value
Items	Mean	SD	Mean	SD	(Perceive d Mean Expected Mean)	
Goibibo provides 24 x 7 customer service.	3.3000	.45	4.6500	.58	1.35	0.000
Goibibo gives prompt and quick respond to customer request.	4.3200	.78	3.3200	.76	(1)	0.000
Goibibo address the customer complaint on priority basis.	2.1900	.67	2.9800	.98	0.79	0.000

Table No. 5: Gap Analysis- Security

	Expected		Actual		GAP	p-Value e
items	Mean	SD	Mean	SD	(Perceive d Mean Expected Mean)	
Goibibo give full security of protecting customer bank details.	3.9000	89	4.4700	.77	0.57	0.000
Goibibo application is safe and secure from hacking.	2.8700	.50	3.9000	.60	1.03	0.000
Goibibo protect customer's personal data.	2.9800	.78	3.8900	.98	0.91	0.000

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Table No. 6: Gap Analysis- Ease of use.

	Expected		Actual		GAP	p-Value e
items	Mean	SD	Mean	SD	(Perceive d Mean Expected Mean)	
Goibibo application is easy to use.	2.7000	87	3.7800	66	1.08	0.000
Goibibo website and application provides various languages to customer.	2.2000	88	4.4800	.77	2.28	0.000
Goibibo is fun to use as provide various games offer and spin wheel.	4.3400	68	3.8900	.74	0.877	0.000

Conclusion

Goibibo was formed in 2009 to help customers by providing them with a platform to help them book their holidays online. The website offers several services such as hotel booking, air, bus and train bookings, etc. It provides easy cancellations and refunds, which is hassle-free. They have brought India out of the traditional ticket booking form with the advance form. The online booking sector has boomed in the last decade, and if various scholars are to be believed, then this sector will only develop into one of the most advanced sectors, which will help the country's development. Our study focused on determining the e-service quality of Goibibo, and the data analysis showed that in terms of website design and application design, the Goibibo website is visually appealing, and the application is also straightforward to download. Also, it is noteworthy that the application and the website load quickly while surfing, which makes it attractive and trustworthy in the eyes of the customers. The Gap Analysis of Reliability data can be concluded by stating that the advertisements conducted by Goibibo are accurate and true and the services provided are reliable and dependable; However, there are many positives; it can be observed that the promises made to the customers by Goibibo are not fulfilled completely. As for the Responsiveness analysis, it can be concluded that Goibibo provides customer services 24x7 and addresses customer complaints on a priority basis, yet they need to provide prompt and quick responses to customer requests.

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Further, the security and Ease to use analysis showed that Goibibo gives full protection towards protecting customer bank details, the application is safe and secure from hacking, and it also protects the customer's personal data. The application was found to be easy to use, provides customers with various language options, is fun to use, and provides several games offer and spin wheels for the customers to enjoy while surfing it. Overall it can be said that the e-service quality of Goibibo excels in various aspects but can still make progress towards fixing their customer support system wherein they provide the customers with prompt and quick responses, and the promises made should be fulfilled, which will only help them in retaining any customers that may be dissatisfied due to the unfulfilled promises.

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BIODIVERSITY CONSERVATION AND CLIMATE CHANGE

Dr. Deepali R. Bhapekar
Dr. Kalpit Ganesh Bhatre

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CONSEQUENCES OF CLIMATE CHANGE IN INDIA

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ABSTRACT:

India is one of the most vulnerable nations in the world to predict climate change and one of the main emitters of greenhouse gases. The nation is already undergoing climate change, and its effects, such as water stress, heat waves, drought, severe storms, flooding, and related detrimental effects on health and livelihoods. Climate change may potentially affect the biodiversity and functionality of forests globally. India is anticipated to experience significant repercussions from the agriculture-related effects of climate change. Every habitat, tree, and animal on Earth contributes to the climate. Additionally, the extinction crisis is currently making the climate issue worse. The biggest step we can take to stabilize the climate emergency is protecting and restoring nature.
KEYWORDS: climate change, biodiversity, extinction, habitat

INTRODUCTION:

Climate change refers to long-term shifts in temperatures and rainfall patterns. Such fluctuations may be brought on by significant volcanic eruptions or variations in the sun's activity. Over the last 200 years, human activities such as the burning of fossil fuels like coal, oil and gas have been responsible for climate change. Fossil fuel combustion produces greenhouse gas emissions that serve as a blanket around the planet which trap the heat from the sun and increasing the temperature. CO_2 and CH_4 are the primary greenhouse gases responsible for climate change. The key industries that produce greenhouse gases include energy, industry, transport, buildings, agriculture, and land use.

The Earth's average surface temperature has increased by around 1.1°C since the late 1800s (before the industrial revolution). The most recent ten years (2011–2020) were the warmest on record. Many believe that rising temperatures are the main

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effect of climate change. But the story doesn't start with the temperature increase. Changes in one place might have an impact on changes in all other areas since the Earth is a system in which everything is interconnected. Intense droughts, water scarcity, destructive fires, rising sea levels, flooding, melting polar ice, catastrophic storms, and a decline in biodiversity are currently some of the effects of climate change.

Every habitat, tree, and animal on Earth contributes to the climate. Additionally, the extinction catastrophe is currently making the climate issue worse. The biggest step we can take to stabilize the climate emergency is protecting and restoring nature. Most people agree that one of the causes of extinction is climate change, which has an impact on biodiversity all around the world. Few people are aware, however, that the decline in biodiversity is also hastening climate change and altering weather patterns throughout the world.

India, which depends heavily on agriculture and has a population of 1.2 billion people but is still rising, would likely see severe effects from ongoing climate change. Given the inherent uncertainties in global climate projections, India's climate is likely to vary in a number of ways in the future:

- According to global observations, glaciers are receding at an average rate of 10–15 meters per year. If the pace rises, river valleys drained by these glaciers are likely to flood. This will be followed by decreased flows, which will lead to a shortage of water for drinking and cultivation.
- Over the Indian subcontinent, all models demonstrate a tendency for increased precipitation, a decrease in the range of diurnal temperature, and a general warming in mean annual temperature. By 2030, the entire country of India is projected to warm by 0.5°C, which is almost comparable to the warming of the 20th century, and by the end of this century, it is likely to warm by 2-4°C, with the northern part of the country seeing the most warmth. Greater tropospheric ozone pollution and other air pollution in the main cities are predicted to result from global warming.
- Increased precipitation including monsoonal rains is likely to cause significant flooding. It is expected that the amount of rain in the form of drizzle will decline. The majority of global models predict a strengthening of the Indian summer monsoons. According to climate models, there may be early snowmelt, which could have a significant adverse effect on agricultural production. Rising aerosol emissions from energy production and other sources may reduce rainfall, resulting in drier circumstances and more dust and smoke from the burning of drier vegetation, which may have an impact on both local and global hydrological cycles and agricultural production.

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The following implications of climate change are most likely to be significant:

Agriculture: Millions of subsistence and smallholder farmers will experience immediate hardship and hunger because of unpredictable weather.Farmers' decisions on what crops to plant and when to grow them will be impacted by uncertainty about monsoonal shifts, which would lower productivity. In addition, earlier seasonal snowmelt and depleting glaciers will reduce the river flow needed for irrigation. The large segment of poor people which includes smallholder farmers and landless agricultural labourers may be severely affected, requiring government relief programs on a massive scale.

Water: Changes in the timing and volume of monsoon rains will increase the uncertainty around the production of food and other agricultural goods, increasing the likelihood that farmers would choose actions that lower productivity even in years with favorable weather.

Increase in Inequality: Governments may shift, public budgets may be strained, and unrest may be sparked by the welfare of individuals who are negatively impacted by climate change and have few resources to adapt.

Energy: Climate change mitigation measures may limit India's usage of domestic and imported coal, oil, and gas as it seeks new energy sources to satisfy expanding demand, and nuclear energy development will be at best gradual and likely to face opposition.

Migration: India welcomes immigrants from many nations. It might become saturated with a lot more people as a result of climate change. Such migration might escalate tensions between the two nations and pressure the national and state governments of India. India's adaptive capacity varies by state, location, and socioeconomic standing. The availability of water, food security, human and social capital, and the capacity of government (at the state and national levels) to protect its citizens during difficult times are all important elements, according to studies. Where there is a lack of adaptive capacity, the likelihood of displaced people, heat-related deaths and property damage, floods and storm damage, and conflicts over natural resources and assets is higher.

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mpacts of Climate Change on Biodiversity:

According to the analysis of seasonal and annual surface air temperatures for ndia (1881–2001) for 25 or more stations, there is a significant annual mean varming of 0.68°C per hundred years. Usually weather temperature occurs in the post-monsoon and winter seasons. In India, the monsoon temperatures doesn't show significant trend in most of region except for a significant negative trend over northwest region.

Nearly 67% of the Himalayan mountain ranges' glaciers, which feed India's principal rivers, have receded in the previous ten years (Lal, 2001). According to the Intergovernmental Panel on Climate Change (IPCC),there have been more hot days and prolonged heat waves during the past century, and in recent years, more deaths have been linked to heat stress in India (Rex, 2007). The northwest experienced a dramatic fall in water tables as a result of the 1999 and 2000 droughts, and 11 million people in Orissa were affected by the 2000–2002 droughts, which caused crop failures and mass starvation.

Inappropriate management decisions about natural hazards can cause conflicts. In 2002, Andhra Pradesh released dam water for electricity generation but not for irrigation under drought conditions. Water rights disputes between states can often turn nasty. Karnataka, a neighbouring state, was accused by Tamil Nadu of breaking agreements about the sharing of water from the Cauvery River (The Economist, 2002). Bangalore is facing acute water scarcity in order to meet the drinking water needs of 7 million people in the city (Nanjundaiah, 2008). Heat and flooding are two examples of how the current experience of climate variability and change affects public health. 18 heat waves were observed in India between 1980 and 1998; one in 1988 affected ten states and resulted in 1,300 fatalities. Orrisa observed 2,120 deaths in 1998-2000 due to heat waves whereas Andhra Pradesh reported more than 3,000 deaths due to heat waves in 2003. India has also reported increased diarrhoea cases in Flood affected areas (Ulisses and Bettina, 2007). The average sea level along the Indian coast has been shown to be rising at a rate of roughly 1 cm every ten years, which is comparable to other regions of the world. Due to tropical storms' increased storm surges, coastal areas in India and Bangladesh are now more vulnerable to wind and flood damage than earlier (Lal, 2001).

What are the implications of biodiversity for climate change?

Biodiversity is the sum total of life on Earth. It encompasses every individual living thing, ranging in size from the smallest mosses to the largest whales, as well as the outcomes brought about by this web of life. The biodiversity of Earth has a direct

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impact on its climate patterns. The most effective and economical action we can take to stabilize the climate disaster is to protect the planet's remaining biodiversity and restore at least one-third of what has been lost over the past 30 years. In contrast to technology and design solutions that are expensive and need to be scaled up in order to be effective, wild nature is already present and working for free (like it has done for 500 million years) to offer everything life needs in order to thrive.

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SPIRULINA AS A SOURCE OF BIOACTIVE COMPOUNDS IN THE FOOD AND HEALTH SECTOR

Abstract

The purpose of the present study is to summarise the mechanisms of action of *Spirulina*, phytochemical, food safety, nanofiber scaffolds, PHB, highlight the potential effects of this alga on humans, and address current and potential future clinical applications, based primarily on *in vivo* studies and a few carefully designed *in vitro* studies, as well as the highest levels of evidence currently available in the literature. The objective of this study is to examine the antioxidant activity of new commercial products containing fresh *Spirulina* and the factors influencing it. Antioxidant activity varies depending on the combination of elements in the meal, according to several studies. government organisations growing *Spirulina* to reduce the cost of purchasing it from private businesses and supplying it as food to anganwadis and ashrams so that it can gradually eradicate the problem of malnutrition in India. The synergy coefficient was used to identify and express synergistic, antagonistic, and additive interactions between samples in order to gradually alleviate the issue of malnutrition in India and other nations. In the present review the bioactive composition of *Spirulina* and potential for different applications in functional foods are covered.

Keywords: Phytochemical, Food safety, Nanofiber scaffolds, PHB

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I. INTRODUCTION

Spirulina are multicellular and filamentous blue-green microalgae belonging to two separate genera *Spirulina* and *Arthrospira* and consists of about 15 species. Of these, *Arthrospira platensis* is the most common and widely available *Spirulina* and most of the published research and public health decision refers to this specific species. *Spirulina* is natural food belongs to plantae kingdom which consists of different phytochemicals. (Balakrishnan *et al., 2*009 and Dawes, 1998). This phytochemicals are biologically significant and plays a vital role in medicinal applications. Many studies revealed that phytochemicals from *Spirulina* used in cancer, tuberculosis, inflammation and many other blood related diseases (Shyamala *et al.*, 2013). The bioactive compound includes proteins, carbohydrates, phenolic compounds, vitamins, and minerals. The production of bioactive compound is depends on environmental conditions such as temperature, pH, nutrients, metal ions and other chemicals (Wijesekara I. *et al*., 2011). These phytochemicals play an important role in the treatment of many chronic diseases. There are two main methods for the analysis of phytochemical screening such as qualitative and quantitative analysis. The qualitative tests are used to identify the constituents. (Wijesekara *et al.*, 2011). *Spirulina* is marketed and consumed in several countries, including, U.S.A, Thailand, Taiwan, Vietnam, China, India and Cuba (Shanmugam M *et al.*, 2000).

II. FIELD OF APPLICATION

Asia has used *Spirulina* for more than a millennium. It has been marketed as a food supplement due to the high-quality protein and additional beneficial components (Ali and Saleh, 2012, Borowitzka, 2013, Priyadarshani and Rath, 2012). *Spirulina* has recently gained popularity as a non-toxic, non-carcinogenic natural blue colourant for use in food and cosmetics (Pandey et al., 2013). In the US, the FDA has designated *Spirulina* extract as a colour additive exempt from certification and authorised its use in ready-to eat cereals (apart from extruded cereals), frostings, ice cream and frozen desserts, dessert coatings and toppings, beverage mixes and powders, yoghurts, custards, puddings, cottage cheese, gelatin, and breadcrumbs. *Spirulina* is a suitable dye for dairy goods, ice cream, and sweets including chewing gum, coatings, chocolate, sugar embellishments, and candies. The shelf life of the finished goods is increased during processing and storage by low temperatures and light exclusion. The colourant is unsuitable for commercial use for watery food items with pH values below 4.5 and alcohol contents above 20%. (Newsome et al., 2014). Additionally, *Spirulina* is utilised as an antioxidant, thickening, and water binding agent, especially in face, skin, and hair care products, as well as a pigment in cosmetics including lip Sticks, eyeliners, and eye shadows. (Priyadarshani and Rath, 2012). Numerous toxicological investigations have validated the safety of *Spirulina*. *Spirulina* is currently one of the items on the US Food and Drug Administration's list of item classified as Generally Recognised as Safe (GRAS). (Tarantino LM.2003.) (Belay A. 2003.) *Spirulina* biomass demonstrates antiallergenic, antibacterial, antifungal, anti-inflammatory antioxidant, and immunomodulating effects in addition to stimulating vital biological processes (Khan et al., 2005). As a result, the biomass of *Spirulina* LEB 18 added to scaffolds promotes cell proliferation and tissue regeneration (Morais et al., 2010. Qureshi MA et al., 1995).

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III. EXPECTED OUTCOMES

With the efforts of researchers and the government, the potential of *Spirulina* must be noticed and brought into use for solving various problems like malnutrition on national and international levels.

Spirulina proves to be an excellent source of micro nutrients like iron iodine, vitamin a foliate zinc, vitamin B1 vitamin B2 and vitamin B3 as all these micronutrients happen to be very effective in recovery from malnutrition. Eradication of malnutrition in Maharashtra gradually with the help of *Spirulina* supplements manufactured by the government.

- Use of *Spirulina* ruminants or expired supplements as a natural fertilizer to crops and other agricultural produce.
- Use of cheaper spiral in a based supplements produced by government for people suffering from anaemia diabetes cholesterol and blood pressure related issues as it aids them very well.
- Eradication of malnutrition in Maharashtra gradually with the help of *Spirulina* supplements manufactured by the government.
- Approximately 3000 tons dry weight is currently produced annually in the United States, Thailand, India, Taiwan, China, Pakistan, and Burma (Raja et al., 2007)

IV. SCOPE APPROACH

The *Spirulina* Market is expected to reach $1.1 billion by 2030, at a CAGR of 9.4% from 2023 to 2030, while in terms of volume, the market is expected to reach 102,381.3 tons by 2030, at a CAGR of 8% from 2023 to 2030

V. USE OF *SPIRULINA* FOOD INDUSTRY

Spirulina are multicellular and filamentous blue-green algae that has gained considerable popularity in the health food industry and increasingly as a protein and vitamin supplement to aquaculture diets.

Earthrise farm was the first *Spirulina* farm in North America, established in 1976, and today is the largest *Spirulina* farm in the world. With over 40 years of experience and a 108-acre site, Earthrise has continued to produce high quality and safe *Spirulina* for consumers around the world. (WWW.Earthrise)

VI. BENEFITS TO THE SOCIETY

Like other blue-green algae, *Spirulina* is susceptible to contamination from poisonous compounds known as microcystins. Additionally, it can take up heavy metals from the water in which it is grown. For these reasons, it's crucial to purchase *Spirulina* from a reputable company.

Spirulina may strengthen the immune system, assist in preventing allergic reactions, and have antiviral and anticancer characteristics, according to test tube and animal research. However, there is no evidence that *Spirulina* offers these or any other advantages to humans. More study is required.

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Nanofiber scaffolds offer tissue engineering potential by replicating extracellular matrix structure and function. Electrospun scaffolds have high surface area, porosity, nutrient diffusion, and promote angiogenesis/vascularization during regeneration. (Ramier J, 2014)

Nanofiber scaffolds can be replaced with *Spirulina* biopolymers, which are biodegradable and compatible with cells and tissues. *Spirulina* biomass can be added to polymer solutions without extreme temperatures or pH, allowing internal components like proteins, fatty acids, and biopolymers to stimulate cells or tissues.

Polyhydroxyalkanoates (PHAs), including polyhydroxybutyrate (PHB), can be extracted from microorganisms like *Spirulina* and used as a toxic biocompatible scaffold for human tissue and organ culture. PHB degrades into a harmless compound, indicating its biocompatibility with cultured cells and tissues. *Spirulina* biopolymer nanofiber scaffolds have lower rejection risks and advantageous bioactive compounds (Sudesh K,et al 2000”and Jau M *et al.*, 2005).

VII. FUTURE SCOPE

Commercial and mass cultivation: In the early 1960s, Japan began a large-scale culture production programme for the microalgae chlorella and *Spirulina*. More than 22 nations currently engage in extensive commercial *Spirulina* cultivation.

VIII. CONCLUSION

Already, *Spirulina* is a well acknowledged and well-liked nutritional supplement. The requirement for studies to support its health advantages is minimal. This is supported by information on its nutritional worth, which makes *Spirulina* a superior option when creating diets and addressing malnutrition.

Preclinical research employing animal models is still being done to assess the bioactive potential of *Spirulina*. However, these researches appear to support the existence of *Spirulina's* potent antioxidant, anticancer, and antiviral activities as well as its ability to prevent diabetes, obesity, and allergic inflammation. Additionally, it has excellent hypoglycaemic, hypocholesterolaemia, and immunomodulatory potential.

The potential of *Spirulina* as a therapeutic food is drawing more attention due to consistent results on its bioactivities. The use of nutraceuticals in the treatment of hypercholesterolemia, hyperglycaemia, cardiovascular disease, and cancer should be quite beneficial. Studying the phytochemical composition, nutritional and biological effects allows the development of new scientific research.

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A Review on Fish Composition

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Abstract:

Fish has important nutrient beneficial to human health. The taste of fish and nutritional value has made it important food source, hence consumed all over the world which in turn increase economy. The principle nutrients of fish are lipid, protein and water. Along with this there are minerals, vitamins and carbohydrate present in fish which has several benefits on health. In this review important nutrient and it's health benefit is accumulated from various sources and summarized.

Introduction:

Fish is a vital source of food for people. The FAO estimates that about one billion people world-wide rely on fish as their primary source of animal protein. Consumption of food fish is increasing, having risen from 40 million tonnes in 1970 to 86 million tonnes in 1998 (FAO, 2000). Although fish is considered as a crucial source of protein, it also contains other significant nutrients that are beneficial to human health. Because of its high nutritional content, fish in small amounts is also sufficient for filling out the nutrient index. The fish has medicinal potential that has significant benefits on human health. It not only improves human health but also guards against numerous health issues. (Li et al., 2020). This point includes a significant literature review of the fish component. Hence it gives a pressure on fish industry to grow fish to fulfill market demand in turn demand of aquaculture raise globally.

Fish nutrients

Fish is high in nutrients, including micro and macronutrients. Proteins, lipids, and a very small quantity of carbohydrates make up the macronutrients. Micronutrients such as vitamins and minerals are also crucial components. (Balami et al., 2019)The significance of several nutrients and water found in fish is further explained here.

Lipids:

Lipids and their constituent fatty acids are, along with proteins, the major organic constituents of fish, with carbohydrates being quantitatively much less prominent in fish. Even though fat is found in all of the tissues in fish, there are places where it is present in exceptionally high amounts, creating depots of fat. Muscles, head tissue, milt, liver, skeletal tissue, subcutaneous connective tissue, and viscera are among places where fish depot fat can be found. However, heart has the lowest level of fat content and the brain has the most. The amount of fat in fish impacts its quality and, consequently, its value (S. K. Gupta & Gupta, 2006).

Moreover, the fatty acids of fish lipids are rich in long chain, highly unsaturated fatty acids (HUFA) that have particularly important roles in animal nutrition (Tocher, 2003) . Wet tissue in the liver has 3.56 to 39.55% total lipids, and meat only contains 0.007 to 0.80 percent. There are up to 25 different fatty acids in marine fish oil; among the saturated fatty acids, myristic, palmitic, and stearic acid are the most prevalent, with lauric and pentadecanoic acid acting as minor components (Ahmed, 1995) . Fish flesh contains omega-3, it helps to reduce extra cholesterol level. Moderate amount of omega – 3 is beneficial for human health like The omega-3 PUFAs tend to lower plasma cholesterol, VLDL plus LDL, and triglycerides (Connor & Connor, 1997; GIBSON, 1988; VON et al., 1978) The preponderance of evidence shows that the consumption of fish or fish oil containing omega-3 polyunsaturated fatty acids reduces the risk of coronary heart disease and it reduces the incidence of stroke (Sidhu, 2003). Consumption of omega-3 PUFAs has caused a mild decrease in systolic and diastolicblood pressures in humans with mild hypertension (Bonna, 1990; Connor & Connor, 1997; Deckere, 1998; Stone, 1996; Takahata et al., 1998; Toft et al., 1995). Fish oil intake has been associated with a low incidence of diabetes mellitus (Malasanos & Stacpoole, 1991; Rustan et al., 1997). Omega-3 PUFAs appear to reduce blood pressure and plasma triglycerides, which appear to improve several metabolic symptoms of insulin resistance in humans. (Berry, 1997). Omega-3 PUFAs may have specific health benefits for pregnant women. These fatty acids may also be important for optimal prenatal and postnatal development (Burdge, 1998). Fish oil–derived n–3 PUFA therapy has clinically important muscle anabolic and physical performance–enhancing effects in older adults (Smith et al., 2015).Omega-3 PUFAs may retard the progression of prostate cancer (Karmali et al., 1987; Rose, 1997). Fish has anti-inflammatory qualities and is linked to a lower risk of cardiovascular disease due to omega-3 polyunsaturated fatty acids (PUFAs). The two key ones are docosahexaenoic acid

(DHA) and eicosapentaenoic acid (EPA). They thin the blood, which decreases the risk of clot formation, by reducing the level of platelet aggregation in the blood.(Gormley, 2012)

Protein:

The high saturated fat found in fatty meat products is minimal in fish, making them excellent sources of protein. Furthermore, unlike other animal products, fish fat is made up of PUFA, which are good for human health (Stone, 1996) . The major functions of fish protein are to strengthen and repair muscular tissue, boost immunity, and enhance blood quality (Balami et al., 2019). Since fish farming has been a source of protein for people for almost 4,000 years, particularly in Asia, fish is an excellent food for humans since it provides all 10 essential amino acids at a desirable concentration. Lysine and methionine is found to be most abundant (S. K. Gupta & Gupta, 2006; Kundam et al., 2018). Protein content in fish muscle ranges from 15–25%. Myogen and myo-albumin are found intracellularly, while albumin is primarily found in the sarcoplasm interstitial fluid. Fish also have myosin, actin, actomyosin, and tropomyosin, which are contractile proteins. Most stroma proteins are collagen and stroma, which are present in connective tissue, cell membrane, and myocommate(S. K. Gupta & Gupta, 2006) . Fish muscles are rich in amino acids, particularly glutamic acid, proline, taurine, glycine, alanine, and arginine, among the water-soluble components. Taurine, an amino acid that has been shown to be involved in several aspects of mammalian development, is an important source of conditionally necessary amino acids and is found in fish. Instead of the carboxylic acid moiety, the molecule has a sulfonic acid group, one of the most prevalent free amino acids in many tissues, including skeletal and cardiac muscle and the brain. This group is not integrated into proteins (Kadam & Prabhasankar, 2010; Kundam et al., 2018).

Dietary protein is required for three key functions. maintenance includes the repair of tissue damage, the replenishment of tissues that have been used up, and growth or the creation of new, extra proteins. The pattern of the amino acids in dietary protein, the amount consumed, the amount of calories in the food, and the animal's physiological condition all have a significant impact on how well it is utilised.(Cowey & Sargent, 1972) The body easily digests and absorbs fish proteins. Taurine has a potential role in lowering blood pressure, enhancing cardiovascular system, and lowering blood cholesterol levels. Fish is a good source of taurine, which is beneficial for cardiovascular health (Gormley, 2012; Kundam et al., 2018). Anti-hypertensive peptides (ACE inhibitors) are present in fish and fish extracts, which lower blood pressure and prevent atherosclerosis (Gormley, 2012).

Vitamins:

Vitamins A, D, and E are plentiful in marine fish oils. Fish liver oils provide the highest concentration of vitamin A. Vitamins A and D are abundant in cod liver oil and halibut (Kadam & Prabhasankar, 2010; Kundam et al., 2018). The vitamin E found in fish liver oils acts as a protection against the oxidation of vitamin A. Marine fish are good source of vitamin B_1 and B_2 and D .(S. K. Gupta & Gupta, 2006)

Carbohydrate

Fish flesh contains negligible amount of carbohydrates and glycogen which is present only in liver. Glycogen is present in living fish and is rapidly converted to lactic acid after death of fish (S. Gupta, 2010; S. K. Gupta & Gupta, 2006).

Minerals

Fish may obtain inorganic atoms from sea or river water, therefore they are rich in essential minerals and trace elements. When compared to foods from the land, seafood contains more of these vital elements. These minerals constitute around 1-2% of flesh (S. Gupta, 2010). Fish is therefore one of the most important sources of calcium (Ca). It is possible to classify the calcium, copper, selenium, zinc, and magnesium found in fish as bioactive substances (Kundam et al., 2018). In addition to these minerals, fish muscles also include copper, manganese, strontium, zinc, aluminium, barium, molybdenum, cobalt, chromium, silver, mercury, lithium, silicon, radium, bromine, fluorine, and iodine. Some species include cadmium and gold. Iodine level in fresh fish muscle is between 130 and 5130 μg/kg, whereas copper content ranges from 1.4 to 4.1 mg/kg.(S. K. Gupta & Gupta, 2006)

Water:

Water content is not same in all fish. Water content of fish varies inversely to the amount of fat present in fish. It can be from 55-83%. Fish like Bombay Duck have more content of water while oily fish have less concentration.

Conclusion:

Due to busy life style it's important for one to have healthy diet to sustain with challenges and to get an appropriate source of healthy protein source with rich omega 3 lipid in that. The good quality and quantity of essential nutrient makes fish as a staple food which is healthy for all human. Although the benefits of fish crucial nutrients are not utilized by vegetarian population. The fish in daily diet even in small quantity can be a key source of protein. Hence the consumption of fish is increasing day by day. The increase in fish consumption will increase economy also mode of employments.

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A Review on Fish Composition

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Abstract:
Fish has important nutrient beneficial to human health. The taste of fish and nutritional value has made it important food source, hence consumed all over the world which in turn increase economy. The principle nutrients of fish are lipid, protein and water. Along with this there are minerals, vitamins and carbohydrate present in fish which has several benefits on health. In this review important nutrient and it's health benefit is accumulated from various sources and summarized.

Introduction:
Fish is a vital source of food for people. The FAO estimates that about one billion people world-wide rely on fish as their primary source of animal protein. Consumption of food fish is increasing, having risen from 40 million tonnes in 1970 to 86 million tonnes in 1998 (FAO, 2000). Although fish is considered as a crucial source of protein, it also contains other significant nutrients that are beneficial to human health. Because of its high nutritional content, fish in small amounts is also sufficient for filling out the nutrient index. The fish has medicinal potential that has significant benefits on human health. It not only improves human health but also guards against numerous health issues. (Li et al., 2020). This point includes a significant literature review of the fish component. Hence it gives a pressure on fish industry to grow fish to fulfill market demand in turn demand of aquaculture raise globally.

Fish nutrients
Fish is high in nutrients, including micro and macronutrients. Proteins, lipids, and a very small quantity of carbohydrates make up the macronutrients. Micronutrients such as vitamins and minerals are also crucial components. (Balami et al., 2019)The significance of several nutrients and water found in fish is further explained here.

Lipids:

Lipids and their constituent fatty acids are, along with proteins, the major organic constituents of fish, with carbohydrates being quantitatively much less prominent in fish. Even though fat is found in all of the tissues in fish, there are places where it is present in exceptionally high amounts, creating depots of fat. Muscles, head tissue, milt, liver, skeletal tissue, subcutaneous connective tissue, and viscera are among places where fish depot fat can be found. However, heart has the lowest level of fat content and the brain has the most. The amount of fat in fish impacts its quality and, consequently, its value (S. K. Gupta & Gupta, 2006).

Moreover, the fatty acids of fish lipids are rich in long chain, highly unsaturated fatty acids (HUFA) that have particularly important roles in animal nutrition (Tocher, 2003) . Wet tissue in the liver has 3.56 to 39.55% total lipids, and meat only contains 0.007 to 0.80 percent. There are up to 25 different fatty acids in marine fish oil; among the saturated fatty acids, myristic, palmitic, and stearic acid are the most prevalent, with lauric and pentadecanoic acid acting as minor components (Ahmed, 1995) . Fish flesh contains omega-3, it helps to reduce extra cholesterol level. Moderate amount of omega – 3 is beneficial for human health like The omega-3 PUFAs tend to lower plasma cholesterol, VLDL plus LDL, and triglycerides (Connor & Connor, 1997; GIBSON, 1988; VON et al., 1978) The preponderance of evidence shows that the consumption of fish or fish oil containing omega-3 polyunsaturated fatty acids reduces the risk of coronary heart disease and it reduces the incidence of stroke (Sidhu, 2003). Consumption of omega-3 PUFAs has caused a mild decrease in systolic and diastolicblood pressures in humans with mild hypertension (Bonna, 1990; Connor & Connor, 1997; Deckere, 1998; Stone, 1996; Takahata et al., 1998; Toft et al., 1995). Fish oil intake has been associated with a low incidence of diabetes mellitus (Malasanos & Stacpoole, 1991; Rustan et al., 1997). Omega-3 PUFAs appear to reduce blood pressure and plasma triglycerides, which appear to improve several metabolic symptoms of insulin resistance in humans. (Berry, 1997). Omega-3 PUFAs may have specific health benefits for pregnant women. These fatty acids may also be important for optimal prenatal and postnatal development (Burdge, 1998). Fish oil–derived n–3 PUFA therapy has clinically important muscle anabolic and physical performance–enhancing effects in older adults (Smith et al., 2015).Omega-3 PUFAs may retard the progression of prostate cancer (Karmali et al., 1987; Rose, 1997). Fish has anti-inflammatory qualities and is linked to a lower risk of cardiovascular disease due to omega-3 polyunsaturated fatty acids (PUFAs). The two key ones are docosahexaenoic acid

(DHA) and eicosapentaenoic acid (EPA). They thin the blood, which decreases the risk of clot formation, by reducing the level of platelet aggregation in the blood.(Gormley, 2012)

Protein:

The high saturated fat found in fatty meat products is minimal in fish, making them excellent sources of protein. Furthermore, unlike other animal products, fish fat is made up of PUFA, which are good for human health (Stone, 1996) . The major functions of fish protein are to strengthen and repair muscular tissue, boost immunity, and enhance blood quality (Balami et al., 2019). Since fish farming has been a source of protein for people for almost 4,000 years, particularly in Asia, fish is an excellent food for humans since it provides all 10 essential amino acids at a desirable concentration. Lysine and methionine is found to be most abundant (S. K. Gupta & Gupta, 2006; Kundam et al., 2018). Protein content in fish muscle ranges from 15–25%. Myogen and myo-albumin are found intracellularly, while albumin is primarily found in the sarcoplasm interstitial fluid. Fish also have myosin, actin, actomyosin, and tropomyosin, which are contractile proteins. Most stroma proteins are collagen and stroma, which are present in connective tissue, cell membrane, and myocommate(S. K. Gupta & Gupta, 2006) . Fish muscles are rich in amino acids, particularly glutamic acid, proline, taurine, glycine, alanine, and arginine, among the water-soluble components. Taurine, an amino acid that has been shown to be involved in several aspects of mammalian development, is an important source of conditionally necessary amino acids and is found in fish. Instead of the carboxylic acid moiety, the molecule has a sulfonic acid group, one of the most prevalent free amino acids in many tissues, including skeletal and cardiac muscle and the brain. This group is not integrated into proteins (Kadam & Prabhasankar, 2010; Kundam et al., 2018).

Dietary protein is required for three key functions. maintenance includes the repair of tissue damage, the replenishment of tissues that have been used up, and growth or the creation of new, extra proteins. The pattern of the amino acids in dietary protein, the amount consumed, the amount of calories in the food, and the animal's physiological condition all have a significant impact on how well it is utilised.(Cowey & Sargent, 1972) The body easily digests and absorbs fish proteins. Taurine has a potential role in lowering blood pressure, enhancing cardiovascular system, and lowering blood cholesterol levels. Fish is a good source of taurine, which is beneficial for cardiovascular health (Gormley, 2012; Kundam et al., 2018). Anti-hypertensive peptides (ACE inhibitors) are present in fish and fish extracts, which lower blood pressure and prevent atherosclerosis (Gormley, 2012).

Vitamins:

Vitamins A, D, and E are plentiful in marine fish oils. Fish liver oils provide the highest concentration of vitamin A. Vitamins A and D are abundant in cod liver oil and halibut (Kadam & Prabhasankar, 2010; Kundam et al., 2018). The vitamin E found in fish liver oils acts as a protection against the oxidation of vitamin A. Marine fish are good source of vitamin B_1 and B_2 and D .(S. K. Gupta & Gupta, 2006)

Carbohydrate

Fish flesh contains negligible amount of carbohydrates and glycogen which is present only in liver. Glycogen is present in living fish and is rapidly converted to lactic acid after death of fish (S. Gupta, 2010; S. K. Gupta & Gupta, 2006).

Minerals

Fish may obtain inorganic atoms from sea or river water, therefore they are rich in essential minerals and trace elements. When compared to foods from the land, seafood contains more of these vital elements. These minerals constitute around 1-2% of flesh (S. Gupta, 2010). Fish is therefore one of the most important sources of calcium (Ca). It is possible to classify the calcium, copper, selenium, zinc, and magnesium found in fish as bioactive substances (Kundam et al., 2018). In addition to these minerals, fish muscles also include copper, manganese, strontium, zinc, aluminium, barium, molybdenum, cobalt, chromium, silver, mercury, lithium, silicon, radium, bromine, fluorine, and iodine. Some species include cadmium and gold. Iodine level in fresh fish muscle is between 130 and 5130 μg/kg, whereas copper content ranges from 1.4 to 4.1 mg/kg.(S. K. Gupta & Gupta, 2006)

Water:

Water content is not same in all fish. Water content of fish varies inversely to the amount of fat present in fish. It can be from 55-83%. Fish like Bombay Duck have more content of water while oily fish have less concentration.

Conclusion:

Due to busy life style it's important for one to have healthy diet to sustain with challenges and to get an appropriate source of healthy protein source with rich omega 3 lipid in that. The good quality and quantity of essential nutrient makes fish as a staple food which is healthy for all human. Although the benefits of fish crucial nutrients are not utilized by vegetarian population. The fish in daily diet even in small quantity can be a key source of protein. Hence the consumption of fish is increasing day by day. The increase in fish consumption will increase economy also mode of employments.

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A Socio - Economic Analysis of Migrant Women Workers in the Construction Industry: A Case Study of Mumbai

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Introduction

This study on women workers employed in India's alternate - largest assiduity, which employs nearly 30 million people, including about 30 of women and numerous settlers, serves as the foundation for this exploration. In numerous corridor of India, migration, especially of the seasonal and indirect variety, has come a crucial element of pastoral ménage livelihood strategies as further and further people of pastoral origin including men, women and children move in hunt of employment openings.

This study focuses on womanish settlers who work in the construction sector and addresses a number of aspects of the indigenous experience that are important to women's social status relative to males and relative to non-migrant population. The exploration focuses on the migration process, the networks where settlers are active and whether womanish settlers actually acquire social and profitable autonomy through geographic mobility

The study also evaluates how well womanish migratory workers in unorganised sectors are suitable to pierce and/ or take advantage of current social security and weal programmes as well as their living and working situations.

Women work substantially as unskilled labourers and have major plant issues like pay envelope demarcation, sexual importunity, poisonous work connections and lower pay. Despite this, the construction sector disproportionately recruits female workers. Since they primarily help men in the plant, their skills are not developed and remain at the same position.

Review of Literature

The review of the literature relates to some of the significant studies and publications about the position of women in the construction assiduity that have been published by different experimenters. The review's primary focus is on issues including gender bias, sexual importunity and women's family circumstances working in the construction assiduity.

Multitudinous academics have studied women who work in colorful diligence. Still, fairly many people have conducted study on the issues facing womanish construction workers.

Anand (1998) examined the traits of construction workers, the maturity of whom were migratory workers, as well as the intervention tactics used to help these women workers access services and come apprehensive of their rights. He stated that unionisation and cooperatives would be effective in the fight for advanced pay and working conditions, and NGOs and other organisations might play a significant part through advocacy and active engagement by raising mindfulness among these women workers.

Kalpanadevi U.V. Kiran (2013) in her paper named" Status of Female Workers in Construction Industry in India", notes that the construction business offers employment openings to numerous good and unskilled workers. The pool employed in this sector deals with a number of challenges at work. The main focus of exploration among academics is a number of enterprises relating to health, job stress, and plant injuries. She lists the important rudiments affecting women's employment status in the sector. She contend that women witness a number of disadvantages relative to men including the fact that they perform unskilled labour. Due to a number of factors, including sexual importunity, gender bias and payment demarcation, it's delicate for them to work in certain surroundings.

Dave Vandana (2012) did exploration on women working in the unorganised sector. The study concentrated on womanish domestic, agrarian, and construction workers. This study's thing was to learn further about the workers' living, working and socio- profitable circumstances. Data was gathered from 350 womanish workers in civic and pastoral areas of three sections of Haryana, Panipat, Kaithal, and Kurukshetra using the multistage stratified arbitrary slice fashion. Workers had to deal with the issues including pay envelope demarcation against women. Working hours were flexible and workplace importunity was frequent.

Rationale

The urbanisation of the world and the construction sector have both educated significant growth. Women in Informal Employment Globalising and Organising (WEIGO) estimates that roughly half (51%) of all construction workers in the nation are women. Being a working woman increases the difficulty of working in the unorganised member of the frugality. The body of being exploration has exfoliate light on the variety of challenges faced by womanish workers. It's pivotal to take over exploration on this subject in order

to understand the goods of current programs and develop new policies in the future.

Integrating qualitative exploration ways will help to give a thorough understanding of a certain miracle. To completely comprehend the profile and issues of women workers, a combination of quantitative and qualitative methodologies is demanded for this study. It's used to comprehend the type and confines of differences and demarcation as well as the degree and extent of differences, and to have knowledge of the prejudice against womanish construction workers.

Scope

Construction will have a 10 emulsion periodic growth rate by 2027, making it one of India's most competitive diligence. We'll be the third- largest global construction request in 2025.

Objectives

The study's objectives include:

- To learn about the socio - economic circumstances faced by women who work in the construction industry.
- To research the issues that female construction employees confront.
- To ascertain the relationship between the social-economic, professional, domestic, and familial facets of female construction workers.
- To offer advice to female construction employees on how to handle their circumstances.
- To examine the disparities in work at the building site based on gender.
- To comprehend the challenges women workers on construction sites confront.
- To investigate the working conditions and occupational health risks faced by female employees.

Research Hypothesis

H01: "Family issues aren't significantly different among the women construction workers living in different neighbourhoods."

H02: "There's no perceptible difference in the particular issues of the women construction workers."

H03: "Women workers in the construction assiduity don't significantly differ from their manly counterparts in terms of problems at work."

H04: "The health - related issues among the women construction workers differ significantly."

Research Methodology

The research methodology was created to examine the socio - economic circumstances of migrant women employed in the construction industry and to draw conclusions about the most pressing problems they encounter as well as the services and facilities they receive, potentially offering suggestions to the research findings. As research requires a thorough examination of the main research problem, it involves descriptive and quantitative research.

- **Primary Data**

  Interviews and surveys using a structured questionnaire were used to gather Primary Data.

  Along with participant interviews, a two-part questionnaire was created and distributed. The first section of the questionnaire consisted of tabular inquiries about the availability of fundamental human needs. Open-ended questions based on various socio - economic characteristics of the participant's lifestyle made up the second portion of the questionnaire.

  In the event that a participants were not literate enough to respond to the written questionnaire, they were verbally interviewed in addition to receiving the questionnaire. The interview was held in Hindi or Marathi to help with the communication gap.

- **Secondary Data**

  Secondary data is the information that has already been gathered from primary sources and is available for use in other researchers' studies. Secondary data was gathered from previously conducted investigations, books, journals, published sources, websites and research papers.

- **Data Collection**

  The Data were gathered using a structured questionnaire. The questionnaire was distributed physically and it was also answered in-person at the interview. There were both open-ended and closed-ended questions in the poll. Data were collected in and around Mumbai City because the sample was restricted to Mumbai due to access restrictions.

- **Sample Design**

  Sample Size: 50 female construction workers

  Nature: Migrant female workers in construction industry

  Area: Mumbai

  Age Group: All age groups

- **Technique Employed**

  Convenient Sample Method

Hypothesis Result

H01: To determine the significant difference in family problems among the women construction workers belonging to different residential area, test is used with the null hypothesis as **"Family issues aren't significantly different among the women construction workers living in different neighbourhoods."**

It is known that among women construction workers, the main family issues are the husband's unwillingness to go to work and her inability to take care for the children because of her late arrival from work.

H02: In order to determine whether there is a difference in personal issues among the female construction workers who live in different neighbourhoods, test is used with the null hypothesis, **"There's no perceptible difference in the particular issues of the women construction workers."**

It is acknowledged that among female construction employees, a lack of talent and a lack of confidence are the two major personal issues. It is further believed that women construction workers' main personal issues are a lack of skill and feeling insecure as a woman. It also demonstrates that among women in the construction industry, having to take care for children and juggling a job and a house are significant personal issues.

H03: To determine whether there is a significant difference in work-related problems among women construction workers who live in different residential areas, test is designed with the null hypothesis "Women workers in the construction assiduity don't significantly differ from their manly counterparts in terms of problems at work."

It is acknowledged that the main workplace issues for female construction workers include managing contractors'/owners' attitudes because of their haughtiness or abuse and carrying building materials up and down a temporary built ladder.

H04: To determine whether there is a significant difference in health-related problems among the women construction workers who live in different residential areas, test is used with the null hypothesis **"The health - related issues among the women construction workers differ significantly."**

It is well known that among women construction workers skin-related illnesses, backbone, and disc disorders as well as uterus-related illnesses, are the major health-related issues. Other problems include dust and allergy-related illnesses including Tuberculosis and Asthma.

Findings

- Less than one-fourth (24%) of the women respondents are between the ages of 26 and 45 which indicates that the respondents' need to work at this age is a result of their poor economic conditions.
- Married status is held by more than half (62%) of the respondents. More than half of the respondents only have an elementary or secondary education.
- The pay range for more than half (64%) of the respondents is between Rs. 5001 and 7000.
- Joint families make up almost half (48%) of the respondents' family types.

- More than a quarter (28%) of the respondents' families has six or more people.
- Only 42% of respondents (or those who responded) live in terraced homes.
- More than half of the respondents (66%) own their home.
- More than (56%) of the respondents lack access to a toilet.
- Most respondents' families (66%) have two wage earners.

Suggestions

- There needs to be a compassionate system in place and the workers' free time needs to be extended. The construction workers must join the construction workers federation and build a fence around them to protect them in order to resolve all of these issues.
- The Board for Construction Workers must step up and offer incentives and support to female workers.
- The female employees must have access to accident and death benefits. Women workers should be included in social security programmes. Workers in the construction industry ought to sign up to join unions. Together, they need to be organised. Thus, they might profit from the organised sector.
- To encourage more women to participate in self-employment training programmes, nationalist banks that administer these programmes must expand their services to rural areas.

Conclusion

The study examined the work-related gender inequalities that exist on the construction site. Due to the prevailing patriarchal social norms, there have been significant inequalities in the gendered division of labour. Due to the lack of opportunity for women to earn more than males, this work disparity is the primary cause of the wage gap between men and women. Because of this, men workers are in a superior position. The working conditions for women are appalling; they are still uninformed of their legal rights and don't even have the leverage to demand them.

The difficulties that women now experience in the construction industry indicate that numerous actions must be taken in this direction. Workers must be made aware of their rights and the many programmes that are available to them. The different informal sector organisations are tasked for maintaining the operations and procedures of the building industry.

It also becomes vital to educate the male employees on these matters. The results of this study encourage additional study in the area and exploration of employers' and regulatory bodies' viewpoints on this industry, while also raising concerns about its flaws.

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A Panoramic Study of Working Women's Knowledge of Tax Saving Schemes in Mumbai

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Abstract

In order for society and the nation as a whole to flourish holistically, the government must play a significant role. Taxes are the primary means by which the government raises funds for spending on the general welfare. The total revenue collected by the government in India through income tax is up to 52.28%. Each taxpayer must figure out how to find the best strategies to reduce their tax bills due to the element of compulsion. However, paying taxes is a constant chore because it directly impacts taxpayers' residual income. So, everyone makes an effort to minimize their tax liability by managing their financial affairs. Every assessed must engage in tax planning in order to minimize their tax liability and comply with income tax regulations. The assessed must be aware of the various legal provisions for tax savings programmes in order to benefit from tax planning. Despite making up 48.00 % of India's population, women have not benefited equally from the country's economic development. Among Indian women 15 years of age and older, less than one-third are employed or actively looking for a job. Working women must become even more financially savvy in this circumstance, strengthening their financial position. India has a gender-neutral income tax. In India, the income tax paid by women is equal to that paid by men. Yet, several tax deductions are available for women to use to raise their income.

This research paper investigates the perception of Working women's attitudes towards tax benefit programmes in the financial capital of the country i.e. Mumbai.

Keywords: *Tax, Women, Tax Saving Schemes, Mumbai.*

Introduction:

The economics and development fields now frequently discuss the empowerment of women. It can also indicate strategies for dealing with other trivialized genders in a specific political or social setting. The term 'female empowerment' refers to a woman's capacity to govern and profit from her resources, assets, income, and free time, as well as her capacity to manage risk and advance her financial situation and general well-being. Although the terms are frequently used interchangeably, gender empowerment emphasizes the contrast between biological sex and gender as a function and applies to persons of any gender. In a certain political or social context, it also alludes to other oppressed genders.

Review of Literature:

Several studies have shown that women make better managers than men, but when it comes to handling money, they rely on their male counterparts. Research has indicated that while professional women have a rudimentary understanding of financial transactions, they are nonetheless uninformed about money management and investing (Sebastian & Appalla Raju, 2016.).

Indian citizens are dissatisfied with their country's tax system as a result of the multiplicity of levies. The taxpaying public has experienced hardships and harassment as a result of taxes levied by the federal, state, and local governments. He needs to speak with many authorities and keep unique records for each of them. A perfect tax system must adhere to Adam Smith's taxation principles. However, because of excessive reliance on

indirect taxes, the tax system faces issues like inequality, regressively, uneconomically, inflationary, etc. (Nishant Ravindra Ghuge & Vivek Vasantrao Katdare,2015). Nishant Ravindra Ghuge & Vivek Vasantrao Katdare,(2015),

Paying taxes is never easy because it has a direct impact on the taxpayer's residual income. So, by managing their financial affairs, every individual always tries to minimize their tax liability. Every assessed must engage in tax planning in order to minimize their tax liability and comply with income tax regulations. To benefit from the advantages of tax planning, various legal provisions for tax savings plans must be known by the assessed. The knowledge of working women about tax benefit programmes and their investing behavior towards tax benefit programmes in Allahabad are the subjects of this study. (Sebastian T. Joseph, Jonathan Joe Pereira, and Abhishek Janvier Frederick, 2017).

Rational and Scope:

Women have made contributions to our society in a variety of fields, including education, the home, medicine, business, law, and the media, among others. Nonetheless, the responsibility is given to their male counterparts when it comes to managing their own hard-earned money or the money of their families. Male family members typically handle matters related to investments, future financial planning, and investments for tax advantages. However, in the current environment, there is a need to understand the complexity of finance, thus the current study is being undertaken to gauge working women's awareness of tax saving programmes.

Objectives of the Study:

1. To research the awareness of tax benefit programmes among working women.
2. To investigate how working women invest in tax benefit programmes.

The Hypothesis of the Study:

The study's hypotheses are as follows:

- Null Hypothesis (H0): In Mumbai, there is a considerable difference in working women's awareness of tax-saving programmes.
- Alternate Hypothesis (H1): In Mumbai, there is no appreciable variation in the level of awareness of tax-saving programmes among working women.

Research Methodology:

The study is carried out in the financial capital of India i.e. Mumbai in Maharashtra state. Investigative research design is the main emphasis of the study. The primary data served as the method for examining the respondent's awareness, while the secondary data served as the foundation for the study. Employed respondents were used as the primary source of information for the study, and personal interviews were used to gauge their awareness.

The study was conducted over a two-month period, starting on October 19 and ending on December 23. The respondents were personally interviewed for the study's primary data utilizing a pretested schedule. The respondents' memories served as the foundation for the primary data obtained. The respondents in this survey are working women in various industries and age groups. 219 individuals who had at least an HSC and at most a postgraduate degree made up the study's sample.

Findings & Discussions:

Table 1.1

Do you know the tax bracket you are in?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Rs.0 to Rs.30 lakh	61	27.90	27.90	27.90
	Rs.3 lakh to Rs.6 lakh	46	21.00	21.00	48.90
	Rs.6 lakh to Rs. 9 lakh	45	20.50	20.50	69.40
	Rs.9 lakh to Rs.12 lakh	34	15.50	15.50	84.90
	Rs.12 lakh to Rs. 15 lakh	26	11.90	11.90	96.80
	Above 15 lakh	07	3.20	3.20	100.0
	Total	219	100.0	100.0	

Table No. 1.1 shows that the highest percentage of respondents i.e. 27.90 fall under Rs.0 to Rs.30 lakh tax slab, whereas the lowest percentage of respondents i.e. fall under Above 15 lakh tax slab.

Table 1.2

Would you wish to know about it if the answer is no?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	158	72.1	72.1	72.1
	No	61	27.9	27.9	100.0
	Total	219	100.0	100.0	

Table No. 1.2 shows that 72.1% respondents were unaware

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of the tax slab in which their income is falling and they were willing to know about it, while 27.9% didn't show interest to know about the tax slabs.

Table 1.3

Do you frequently pay taxes?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	116	53	53	53
	No	103	47	47	100.0
	Total	219	100.0	100.0	

Table No. 1.3 shows that 53% of respondents were regular taxpayers and 47 % were not.

Table 1.4

Do you know the tax rate you are currently paying?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	0%	18	8.2	8.2	8.2
	5%	64	29.2	29.2	37.4
	10%	13	5.9	5.9	43.3
	15%	31	14.2	14.2	57.5
	20%	23	10.5	10.5	68
	30%	19	8.7	8.7	76.7
	Don't Know	51	23.3	23.3	100.0
	Total	219	100.0	100.0	

Table No. 1.4 shows that 23.3% of respondents were not aware of the fact that what tax rate is been charged on their income.

Table 1.5

If not, do you want to know what your current rate is?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	35	68.62	68.62	68.62
	No	16	31.38	31.38	100.0
	Total	51	100.0	100.0	

Table No. 1.5 shows that out of 51 respondents questioned in Table 1.4 who were not aware of the tax rate applicable to them, 68.62% of respondents were willing to know about their current rate of tax and still 31.38% were reluctant to know.

Table 1.6

Do you know that the Finance Act, which was passed by Parliament, causes the annual additions and deletions to the Income Tax Act?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	165	75.3	75.3	75.3
	No	54	24.7	24.7	100.0
	Total	219	100.0	100.0	

Table No. 1.6 shows that 75.3% of respondents were aware of annual modification to the Tax Act while 24.7% were not aware of it.

Table 1.7

Do you have a working knowledge of the numerous items (farm income, gratuiti es, LIC, payments from PF, sums received as presents, shares from partnership firms) that are tax-exempt?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	155	70.8	70.8	70.8
	No	64	29.2	29.2	100.0
	Total	219	100.0	100.0	

Table No. 1.7 shows that 70.8% of respondents were aware of various incomes which are exempted from tax while 29.2% were not aware of it.

Table 1.8

Are you familiar with the deductions allowed by Chapter VI-A of the Income Tax Act of 1961 (NSC, LIC, PF)?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	141	64.4	64.4	64.4
	No	78	35.6	35.6	100.0
	Total	219	100.0	100.0	

Table No. 1.8 shows that 64.4% of respondents were aware of deductions permissible under chapter VI-A of the income tax act, 1961 (NSC, LIC, PF) while 35.6 % were not aware of it.

Table 1.9

Are tax returns required for all taxpayers?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	149	68	68	68
	No	70	32	32	100.0
	Total	219	100.0	100.0	

Table No. 1.8 shows that 68% of respondents were aware that all the taxpayers have to file their tax return while 32% were not aware of it.

Table 1.10

Is there a fine for filing a false tax return?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	141	64.4	64.4	64.4
	No	78	35.6	35.6	100.0
	Total	219	100.0	100.0	

Table No. 1.8 shows that 64.4% respondents were aware fine is imposed if false tax return is filed while 35.6% did not know about it.

Table 1.11

Do you know about the new tax rate that the Finance Minister approved for the 2023 budget?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	158	72.1	72.1	72.1
	No	61	27.9	27.9	100.0
	Total	219	100.0	100.0	

Table No. 1.8 shows that 72.1% of respondents were aware of the new tax rate that the Finance Minister approved for the 2023 budget while 27.9% did not know about it.

Table 1.12

Are you familiar with tax-saving strategies, plans, or procedures?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	133	60.7	60.7	60.7
	No	86	39.3	39.3	100.0
	Total	219	100.0	100.0	

Table No. 1.8 shows that 60.7% of respondents were familiar with tax-saving strategies, plans, or procedures while 39.3% did not know about them.

Table 1.13

If so, what types of schemes have you invested in?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	ULIP	19	8.7	8.7	8.7
	PPF	48	27.9	27.9	36.6
	Tax Saving FD	61	21.9	21.9	58.5
	EPF	22	10	10	68.5
	NSC	15	6.8	6.8	75.3
	NPS	12	5.6	5.6	80.9
	Infrastructure Bonds	15	6.8	6.8	87.7
	Tax Saving Mutual Funds	13	5.9	5.9	93.6
	Other	14	6.4	6.4	100.0
	Total	219	100.0	100.0	

Table No. 1.14 shows that the highest percent of respondents i.e. 27.9 invested in PPF whereas the minimum investment i.e. 5.6 percent was in NPS.

Table 1.14

Where do you receive the information for your investments?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Friends and Relatives	43	19.6	19.6	19.6
	Newspapers	48	21.9	21.9	41.5
	TV/Radio Advertisements	50	15.5	15.5	57
	Internet	28	12.8	12.8	69.8
	Investment Consultant	34	22.8	22.8	92.6
	CA	16	7.4	7.4	100.0
	Total	219	100.0	100.0	

Table No. 1.14 shows that the highest percentage of respondents i.e. 22.8 % receive the information from Investment Consultant while 7.4 percent of respondents receive the information from CA.

Table 1.15

What is the pattern of your investment?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Monthly (SIP)	59	32.4	32.4	32.4
	Once in a Six Months	71	26.9	26.9	59.3
	Once in a Year	60	27.4	27.4	86.7
	Very Rare	29	13.3	13.3	100.0
	Total	219	100.0	100.0	

Table No. 1.15 shows that the highest percentage of respondents i.e. 32.4% invest in Monthly SIP whereas 27.4% of respondents invest once a year.

Table 1.16

What percentage of your income do you save and what do you spend? Savings versus Spending.					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	10:90	40	18.3	18.3	18.3
	20:80	45	20.5	20.5	38.8
	30:70	42	19.2	19.2	58
	40:60	33	15.1	15.1	73.1
	50:50	44	20.1	20.1	93.2
	Other	15	6.8	6.8	100.0
	Total	219	100.0	100.0	

Table No. 1.16 shows that the highest percentage of respondents belong to the 20:80 ratios of saving and expenditure, while 6.8% of respondents belong to another ratio.

Table 1.17

Which investments?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Long-term (greater than 3yr)	66	30.1	30.1	30.1
	Medium-term (1yr To 3yr)	91	41.5	41.5	71.6
	Short-term (Less than 1 yr)	62	28.4	28.4	100
	Total	219	100.0	100.0	

Table No. 1.17 shows that the highest percentage of respondents i.e. 41.5%invest in Medium Term (1yr to 3yr), while 28.4% of respondents invest in Short Term (Less than 1 year).

Table 1.18

What percentage of your savings are allocated to long-term, medium-term, and short-term goals?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	10:20:70	31	14.2	14.2	14.2
	20:30:50	76	34.7	34.7	48.9
	30:40:30	70	32	32	80.9
	Other	42	19.1	19.1	100.0
	Total	219	100.0	100.0	

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Table No. 1.18 shows that the highest percentage of respondents i.e. 34.7% belong to the 20:30:50 ratio while 14.2% of respondents belong to the 10:20:70 ratio.

Table 1.19

Goals for your investment					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Return	52	23.7	23.7	23.7
	Liquidity	42	19.2	19.2	42.9
	Safety	62	28.3	28.3	71.2
	Reliability	40	18.3	18.3	89.5
	Low Risk	19	8.7	8.7	98.2
	Other	4	1.8	1.8	100.0
	Total	219	100.0	100.0	

Table No. 1.19 shows that the main objective of the respondents for investment is Safety i.e. 28.3% while 23.7 % of respondents preferred return as their objective of investment.

Table 1.20

Which one do you consider to be the finest investment instrument?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Saving Deposit	44	20.1	20.1	20.1
	Fixed Deposit	35	16	16	36.1
	Insurance	35	16	16	52.1
	Equity	38	17.4	17.4	69.5
	Debenture	27	12.3	12.3	81.8
	Gold	20	9.1	9.1	90.9
	Silver	8	3.7	3.7	94.6
	Post Office Saving Deposit	7	3.2	3.2	97.8
	Other	5	2.3	2.2	100.0
	Total	219	100.0	100.0	

Table No. 1.20 shows that the highest percentage of respondents i.e. 20.1% consider Saving Deposits as the finest instrument of investment while 2.2% of respondents considered other instruments.

Table 1.21

Do you believe that investing in tax-saving strategies will promote economic growth?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	132	60.2	60.2	60.2
	No	87	39.8	39.8	100.0
	Total	219	100.0	100.0	

Table No. 1.21 shows that 60.2% of respondents agreed investing in tax saving schemes will promote economic development while 39.8 % disagreed with the question.

Table 1.22

Is it necessary to educate Mumbai's working women about the advantages of participating in tax-saving plans?					
Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	Yes	171	78.1	78.1	78.1
	No	48	21.9	21.9	21.9
	Total	219	100.0	100.0	

Conclusion:

The study's main goal was to determine how well-informed customers were about tax incentive programmes. Customers can invest their money in certain industries and receive additional tax breaks if they are aware of the methods by which they can take advantage of tax benefits. Additionally, to comprehend how customers invest in these tax benefit programmes. According to the survey, a significant percentage of working women i.e. 23.3% are unaware of the tax rate they are paying.

Recommendations:

- ❖ The government should take the required measures to improve financial literacy among working women. Proper financial education should be provided to the working women.
- ❖ It is necessary to establish information centers for any inquiries regarding tax-saving plans and investment options.

Constraints of the Research:

- ❖ Only the working women in Mumbai are the subject of the current study.
- ❖ The majority of responders were hesitant to divulge their private information.

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RETHINK REVOLUTION: TRANSFORMATIVE WAVES ACROSS DISCIPLINES

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2

WOMENS' KNOWLEDGE AND CONSUMPTION OF MILLETS: A CASE STUDY OF MUMBAI CITY

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Abstract: *A vital food crop for the world that has a big economic influence on emerging nations is millet. Millets are thought to be an incredibly nutrient-dense, low-energy diet that can help combat malnutrition. Probiotics and prebiotics are believed to be present in millet-based foods, which may have positive health effects. Millets don't need to be produced with artificial fertilizers or pesticides, and their cultivation uses very little water. Throughout the past 50 years, despite all of the millet farming method's amazing benefits and capabilities, the area used for millet production and consumption has shrunk. In order to learn more about women's intake and understanding of millets, a study on the topic has been carried out.*

The study data was collected using a Google form questionnaire. A total of 68 samples were chosen for the investigation. The study established general information about womens' knowledge, attitude, practices, frequency of consumption and the kinds of meals made with millets.

Keywords: *Millet, Women, Mumbai, Knowledge, Consumption*

1. Introduction

Indian millets are a class of highly nutritious, drought-tolerant plants that are mostly cultivated in the country's arid and semi-arid areas. These grasses are small-seeded members of the Poaceae family of plants. They are a critical component of India's ecological and economic security and provide millions of resource-poor farmers with food and fodder. "Coarse cereals" or "cereals of the poor" are other names for these millets. Because Indian millets are high in protein, vitamins, and minerals, they are a more nutritious option than wheat and rice. They are also low in glycemic index and gluten, so those with diabetes or celiac disease can benefit greatly from them. India is one of the world's top 5 millets exporters. Millet exports worldwide have surged.

Cereal goods are the world's largest exporter and producer, respectively, from India. In 2021–2022, India's cereal exports totaled Rs. 96,011.42 Crore, or 12,872.64 USD million. During the same year, 75% of India's total cereal exports were made up of rice, both Basmati and Non-Basmati varieties. Conversely, just 25% of the cereals exported from India during this time were other grains, such as wheat.

The Nutritional Value and Health Benefits of Millets

Niacin, which is vital for good skin and organ function, is abundant in millet. Additionally, it contains beta-carotene, particularly in the dark-colored grains, which strengthens your immune system, aids in the body's battle against free radicals, and transforms to vitamin A.

Compared to most other grains, millet has more necessary amino acids and is high in calcium and protein. It's also an excellent source of Vitamin A, Vitamin B, Phosphorus, Potassium, Antioxidants, Niacin and Iron.

There are further health advantages of millet:

- Regulates blood sugar: Due to their low glycemic index (GI), millets can prevent blood sugar spikes after meals. Millets are a healthy whole grain, especially if you have type 2 diabetes, since they include non-starchy polysaccharides, fiber, and indigestible carbohydrates that help manage blood sugar.
- Enhances intestinal well-being: Both soluble and insoluble dietary fiber are abundant in millets. Being a prebiotic, the insoluble fiber helps the beneficial microorganisms in your digestive system. Additionally, the fiber gives your stool more volume, which promotes regularity and lowers your risk of colon cancer.
- Shields the heart: Soluble fiber, found in millets, traps fat in the digestive tract and lowers blood cholesterol. That may lessen your risk of developing heart disease, called atherosclerosis. Magnesium is also abundant in millets and may help prevent heart failure.
- Encourages antiaging: Your body's sugar metabolism has a big role in how old you get. Rich in phytates, phenols, and tannins, millet helps shield your cells against harm and dangerous illnesses including diabetes, high blood pressure, and high cholesterol.
- Creates wholesome cells: B vitamins, which are essential for normal cell division and brain function, are abundant in finger millet. Folate, or vitamin B9, is necessary for the production of healthy red blood cells.

Indians also ate millets and their byproducts because of the benefits of millets mentioned above. Numerous research was done on the advantages and nutritional information, extremely limited research done on the knowledge and consumption of millets. Thus, the current research was intended to investigate the knowledge and consumption of millet on selected women in Mumbai city.

2. Reasons for Decline in Production and Consumption of Millets

The Niti Aayog report notes that, in spite of the advantages of cultivating millets, Indian farmers' preferences for growing rice and wheat have gradually shifted. This change can be ascribed to the emphasis and promotion of wheat and rice production as well as the absence of appropriate programmes and assistance for millet farming. The area used for millet production has decreased as a result. Modern agricultural methods have supplanted traditional farming systems, which frequently included millet cultivation, by giving priority to high-yielding crops like rice, wheat, and maize. A number of reasons, such as government policies, the ease of cultivation, and market demand, have led to the neglect of millets in favor of these crops.

Dietary preferences and consumption patterns shift with the modernization and urbanization of societies. Refined grains, processed foods, and other cereals have supplanted millets, which were previously basic diets in many areas. Because of this change in eating habits, there is less of a market for millets, which has decreased production of them. In terms of research, development, and technological developments, millets have gotten comparatively less attention than important cereal crops like wheat and rice. Millets have suffered from low investment in agronomic practices, crop development, and breeding programmes, which has reduced their productivity and competitiveness.

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When compared to other major cereals, millets are often more resistant to heat, drought, and other unfavorable climatic conditions. Still, changes in temperature, patterns of precipitation, and the frequency of extreme weather events brought on by climate change may have a detrimental effect on millet output. Crop failure and lower yields can result from heat waves, extended droughts, and erratic rains. Millet growers have difficulties due to inadequate storage facilities, processing units, and market links. Farmers are deterred from investing in millet farming by poorer profitability stemming from inadequate infrastructure and market assistance.

3. Review of Literature

Amadan et al. (2013) examined millets' nutritional makeup and health advantages. Millions of underprivileged people in Asia and Africa use millets as a primary diet. When combined with other protein sources, millets have a higher energy level from carbohydrates than other cereals, which can help make up for any amino acid deficiencies.

In 2008, Michaelraj and Shanmugam conducted research on the consumption and cultivation of millets in India. According to the study's findings, millets are being harvested and consumed at a decreasing rate as of 2012. As a result, they recommended that research, state-level training programmes, minikit demonstrations, improved seed supply, non-monetary inputs, and massive education and promotion campaigns be launched for millet. Additionally, they recommended that the government use its media campaign funds to support millet promotion.

4. Statement of the Problem

Millets have long been a mainstay of the Indian diet, particularly in rural areas, and are still widely consumed today. They have played a significant role in Indians' well-balanced meals. According to the Indian government, millet is a dependable crop that may be used to increase farmers' profits and guarantee food and nutrition security in India.

Although millets are strong in protein and antioxidants and have a high nutritional value, they have never been seen as trendy meals. That being said, India has succeeded admirably in providing its citizens with the necessary number of calories.

Millet production and consumption have experienced a significant downturn in India, as in many other nations. Wheat's growing dominance in the market also affected how the public perceived millets. The goal is to elevate the humble millet's standing globally, as India is the world's largest producer and second-largest exporter.

5. Objectives of the Study

- To ascertain the respondents' socio - economic standing.
- To ascertain the knowledge and procurement of millet by the participants in their daily lives.
- To examine the rationale behind millets' usage among female consumers.

6. Research Methodology

Mumbai, in the state of Maharashtra, is the financial center of India and serves as the study's location. The primary focus of the research is an investigative research design. The respondent's awareness was examined using the primary data, and the secondary data functioned as the base for the research.

Respondents who were women served as the main information source. personal interviews were employed to assess their awareness for the study. The research was carried out for one month, beginning on August 2nd and concluding on September 11th. The primary data for the study was collected through in-person interviews with the respondents using a pretested schedule. The original data was based on the recollections of the respondents. The survey's participants include 316 women from a range of sections of the society.

7. Findings and Discussion

Table 1.1

Age				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	20 - 30 Years	**65.10**	**65.10**	**65.10**
	31 - 40 Years	**19.00**	**19.00**	**84.10**
	41 - 50 Years	**09.50**	**09.50**	**93.60**
	Above 50 Years	**06.40**	**06.40**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.1** shows that the highest percentage of respondents i.e. 65.10 fall under the age group of 20 - 30 years, whereas the lowest percentage of respondents i.e.6.40 fall under 50 years and above age group.

Table No. 1.2

Education				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	No Formal Education	**00.00**	**00.00**	**00.00**
	Upto 10th Standard	**04.60**	**04.60**	**04.60**
	Upto 12th Standard	**27.70**	**27.70**	**32.30**
	Graduation	**33.80**	**33.80**	**66.10**
	Post graduation	**33.80**	**33.90**	**100.00**
	Total	**100.0**	**100.0**	

The **Table No. 1.2** shows that the highest percentage of respondents i.e. 33.90 are post graduate, whereas none of the respondents is without formal education.

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Table No. 1.3

Occupation				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Homemaker	**07.60**	**07.60**	**07.60**
	Private Service	**21.20**	**21.20**	**28.80**
	Government Service	**12.10**	**12.10**	**40.90**
	Business	**03.00**	**03.00**	**43.90**
	Student	**56.10**	**56.10**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.3** shows that the highest percentage of respondents i.e. 56.10 are post students, whereas the lowest percentage of the respondents i.e. 07.60 are homemakers.

Table No. 1.4

Monthly Income of the Family				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Below Rs. 10,000	**20.60**	**20.60**	**20.60**
	Rs. 10,001 - Rs. 20,000	**28.60**	**28.60**	**49.20**
	Rs. 20,001 - Rs. 30,000	**9.50**	**9.50**	**58.70**
	Above Rs. 30,000	**41.30**	**41.30**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.4** shows that the highest percentage of respondents i.e. 41.30 fall under the income group of above Rs. 30,000, whereas the lowest percentage of the respondents i.e. 09.50 fall under the income group of Rs. 20,001 - 30,000.

Table No. 1.5

Nature of the Family				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Joint Family	**32.30**	**32.30**	**32.30**
	Nuclear Family	**67.70**	**67.70**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.5** shows that the higher percentage of respondents i.e. 67.70 live in a joint family whereas the lower percentage of the respondents i.e. 32.30 live in a joint family.

Table No. 1.6

Members in the Family				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	02	**04.5**	**04.5**	**04.5**
	03 - 04	**40.90**	**40.90**	**45.40**
	Above 04	**54.60**	**54.60**	**100.00**
	Total	**100.00**	**100.00**	

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The **Table No. 1.6** shows that the highest percentage of respondents i.e. 54.60 have more than 04 members in their family whereas the lowest percentage of the respondents i.e. 04.50 have 02 members in their family.

Table 1.7

Do you know about Millets?				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Yes	**72.3**	**72.3**	**72.3**
	No	**27.7**	**27.7**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.7** shows that 72.30% of respondents know about the millets whereas 27.7% of the respondents don't know about the millets.

Table 1.8

If yes, can you give some examples of Millets?

72.30% of the respondents who know about the millets gave following examples of millets: Sorghum, Jowar, Bajra, Ragi and Kakum.

Table 1.9

How often do you purchase Millets?				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Daily	**03.30**	**03.30**	**03.30**
	Weekly	**08.30**	**08.30**	**11.60**
	Monthly	**45.00**	**45.00**	**56.60**
	Rarely	**28.30**	**28.30**	**84.90**
	Never	**15.00**	**15.10**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.9** shows that the highest percentage of respondents i.e. 45.00 purchase millets monthly whereas the lowest percentage of the respondents i.e. 3.30 purchase it daily.

Table 1.10

What is your monthly expenditure on Millets?				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Below Rs.100	**19.00**	**19.00**	**19.00**
	Rs.101 - 200	**24.10**	**24.10**	**43.10**
	Rs. 201 - 500	**17.20**	**17.20**	**60.30**
	Above Rs. 500	**20.70**	**20.70**	**81.00**
	None	**19.00**	**19.00**	**100.00**
	Total	**100.00**	**100.00**	

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The Table No. 1.10 shows that the highest percentage of respondents i.e. 24.10 spend Rs. 201 - Rs. 500 monthly on millets whereas the lowest percentage of the respondents i.e. 19.00 spend below Rs.100 montlhy and 19.00 percent of respondents never buy millets.

Table No. 1.11

Why do you consume Millets?				
Valid		**Percent**	**Valid Percent**	**Cumulative Percent**
	Nutritious Food	**64.30**	**64.30**	**64.30**
	Lower Price Compared to Wheat and Rice	**10.70**	**10.70**	**75.00**
	Convenience	**05.40**	**05.40**	**80.40**
	Losing Weight	**12.50**	**12.50**	**92.90**
	The Best Food for Diabetics	**04.25**	**04.25**	**96.92**
	To Reduce the Consumption of Wheat and Rice	**01.50**	**01.50**	**98.42**
	Taste	**01.58**	**01.58**	**100.00**
	Total	**100.00**	**100.00**	

The **Table No. 1.11** shows that the highest percentage of respondents i.e. 64.30 consume millets as a nutritious food whereas the lowest percentage of the respondents i.e. 01.50 consume it to reduce the consumption of wheat and rice.

8. Suggestion

Millet boasts an incredible nutritious content, with distinct qualities found in every species. Among their many benefits are lowering blood pressure, controlling weight, managing diabetes, and preventing malnutrition. Thus, in order to increase consumer knowledge of and consumption of millets, the government should put certain initiatives into place. To encourage farmers to produce more millet at a lower cost, for instance, the government might provide financial incentives as well as help with the acquisition and storage of the grain. In addition to creating new markets for the grain, the government can support research and development related to millet production. Ration stores are the most affordable place to get millets.

Information regarding the benefits of using millet to solve the problem of malnutrition can be distributed through all media types.

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Sustainable Solid Waste Management Practices An overview of Pune Municipal Corporation

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Abstract

Solid waste is a major problem throughout the world. Many countries and urban local bodies are spending on solid waste management in the budget ranging from 20% in low income countries to 5% in developed countries and 10% in developing countries. Many underdeveloped countries are spending 20% of their income for solid waste management even though 90% waste is openly dumped or burned. Poorly managed waste is contaminating World Ocean, clogging drains, harming animals and economy in various ways. Collection, Transfer, Recycling, combustion, landfilling solid waste management practices are followed by many urban local bodies. Pune Municipal Corporation is also facing the same issue for solid waste management. Apart from Pune Municipal Corporation, stake holders, NGO have given major contribution for solid waste management in city.The Municipal Corporation practices Collection, segregation, transport, treatment and disposal for solid waste management. It is known for effective door to door collection services, biomethanation plants, and biofuel plants, recycling and composting of waste. The present paper has focused on various innovative sustainable solid waste management practices in detail. The data is collected from secondary sources like Pune Municipal Corporation open data, National Institute of Urban Affairs, Maharsahtra Pollution Control Board, SWaCH NGO and analyzed for better understanding. PMC and its stake holders are heading towards sustainable solid waste management. But still they are successful to divert only 18% of the waste from reaching landfill site which can be improved in future.

Keywords: *Solid Waste Management, Sustainable Development, Zero Waste, Green Energy*

Introduction

At international level the largest waste category is food waste making up to 44% of global waste, Dry recyclable waste (Plastic, Paper, metal, cardboard and glass) accounts for 38% of waste, Waste composition varies consider by income levels rise. The percentage of organic matter in waste decreases as income level rises. Consumed goods in higher income countries include more material such as paper, plastic then they do in lower income countries. According to FAO food lost waste is roughly 30% of all food globally. This amount is 1.3 Billion ton per day. Which is wastage of resources including land, water and energy used to produce food. It strongly contributed climate change because greenhouse gases emitted during food production and distribution activities and methane is released during the decay of wasted food. (Kaza, Silpa, Lisa Yao, Perinaz Bahda- Tata and Frank Van Woerden, 2018)

Solid waste management Rule 2000 was revised in 2016 by Ministry of Environment to regulate effective collection, treatment and disposal of all solid waste in India. Under this rule responsibility of solid waste management in cities has been entrusted with Urban Development Department and local Urban bodies (ULB). All municipal corporation and municipalities have to prepare a solid waste management plan. As per Municipal Solid Waste Management Rule 2016, it is mandatory to all waste generator to segregate waste, the institutions with an area greater than 5000 Sq.m. have to manage their own waste. Further it added that an extended producer responsibility on brand owner to set a collect back scheme for managing waste during packaging. The rule has suggested options like biomthenation, waste to fuel oil, composting other than incineration. Waste to energy for treating different stream of waste like inclusion of Market Development Mechanism in addition to directive to department of fertilizer to market city compost along with chemical fertilizer. The rule also declared that provision has made for local bodies to levy waste collection fees or penalty on waste generator for non-compliance of waste but it has be to be announced by law. (NIUA, 2019)

Waste is useless by product of human activities which physically contains the same substance that is available in the useful product. It is observed from recent research that many ULB in India are unable to handle such huge quantities of solid waste due to Institutional and financial debilities. While daily collection efficiency is around 50 to 60% and 90% in few ULB. Only 10% of collected waste receives treatment and virtually nothing is scientifically disposed in engineering landfill site. Where Pune Municipal Corporation has come with zero waste project for solid waste management. The projectat Katraj ward no.141 was undertaken with association of NGO Janwani. The corporation banned open dumping in

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2010 and all disposals are done using scientifically disposal only. There are five decentralized waste processing plants across city. PMC has activated New Mobile SMS alert system for timely and effective complaints redressal regarding garbage container. The sustainability of this system is relied upon household and commercial properties for segregation of waste. This type of the model is first in India that received ISO certification for solid waste collection and transportation. After successful implementation of this model it is implemented in 20 selected Prabhag (electoral ward) in phased manner. (shyamala Mani and Satpal Singh , 2015). The present paper is study of such various sustainable practices in Pune Municipal Corporation.

Waste is classified in to three types on basis of physical state, biodegradability and effects on human health. On the physical state further it classified in to solid (seen by naked eyes), liquid (home and industrial effluents) and gaseous (not seen by naked eyes). On the basis of biodegradability it is divided in biodegradable (organic) and non-biodegradable (Metal, plastic, paper and glass). On the basis of effects on human health it is classified as hazardous (dangerous) and non-hazardous (non-dangerous). (Vijayalakshmi, 2020)

(Vijayalakshmi, 2020)Author has made critical review on Modern Solid waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, land filling, incineration, bioremediation and waste to energy.

Need of Study

Many cities face various problem related to solid waste management like financial capacity, limited access to technical knowledge and equipment, expertise, staff capacity, political turnover, government coordination with local authority, working condition, communication, land availability, geography and cultural norms. (U.S.EPA, 2020, p. 11)

Study Area

Pune is known as existed town since 937 AD. It is originally called as Punawadi. During British time it has served as a cantonment town and Monsoon Capital. Pune city has emerged as not only an educational hub but also major prominent location for IT and Automobile Industry. The city covers 331.26 Sq. Km Area. Pune is second largest city in Maharashtra after Mumbai and ninth in India. Its estimated population is 49,82,000 as [illegible] 5,0000 as. Km. Pune is the [illegible] Asia-Pacific region. The city has shown [illegible] growth rate in 60 years. (World Population Review

Objectives of Study

1. To study solid waste management practices [illegible] Municipal Corporation.
2. Find out various sustainable practices in Pune [illegible] Corporation.
3. To find out effects of sustainable solid waste [illegible] practices on human, environment and economy.

Research Methods

The data regarding solid waste management collected [illegible] official website of Pune Municipal Corporation, Maharashtra Pollution Control Board and reports of National Institute of Urban Affairs. Secondary data is used to understand waste management in study area. Tables, charts are used for better illustration and understanding.

Solid waste management consist of series of [illegible] collection of waste, segregation of waste at its source, transporting carefully and labeling them, undergoing [illegible] type of treatment in order to reduce its hazardous [illegible] disposing it by burning, burying and recycling methods. All this steps prevent the spread of pollution, reduce its hazardous effects and keep the environment clean. The environment become good habitat for all living [illegible] (Vijayalakshmi, 2020)Pune Municipal Corporation started environment friendly activities like Zero Waste Model, plastic waste management, competition at ward level to promote cleanliness. The present work focuses on waste management at different level collection, segregation, disposing treatment and landfilling. (Vijayalakshmi, 2020) Author has made critical review on Modern Solid Waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, landfilling, incineration, bioremediation and waste to energy.

Solid Waste generation in Pune Municipal Corporation

It has been estimated that PMC generated 1500 to 1[illegible] solid waste. Per capita waste generation is 450 to [illegible] per capita per day. The PMC is divided in 15 Administrative wards each wards generate average solid waste ranging

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2010 and all disposals are done using scientifically disposal only. There are five decentralized waste processing plants across city. PMC has activated New Mobile SMS alert system for timely and effective complaints redressal reading garbage container. The sustainability of this system is relied open household and commercial properties for segregation of waste. This type of the model is first in India that received ISO certification for solid waste collection and transportation. After successful implementation of this model it is implemented in 20 selected Prabhag (electoral ward) in phased manner. (shyamala Mani and Satpal Singh , 2015). The present paper is study of such various sustainable practices in Pune Municipal Corporation.

Waste is classified in to three types on basis of physical state, biodegradability and effects on human health. On the physical state further it classified in to solid (seen by naked eyes), liquid (home and industrial effluents) and gaseous (not seen by naked eyes). On the basis of biodegradability it is divided in biodegradable (organic) and non-biodegradable (Metal, plastic, paper and glass). On the basis of effects on human health it is classified as hazardous (dangerous) and non-hazardous (non-dangerous). (Vijayalakshmi, 2020)

(Vijayalakshmi, 2020)Author has made critical review on Modern Solid waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, land filling, incineration, bioremediation and waste to energy.

Need of Study

Many cities face various problem related to solid waste management like financial capacity, limited access to technical knowledge and equipment, expertise, staff capacity, political turnover, government coordination with local authority, working condition, communication, land availability, geography and cultural norms. (U.S.EPA, 2020, p. 11)

Study Area

Pune is known as existed town since 937 AD. It is originally called as Punawadi. During British time it has served as a cantonment town and Monsoon Capital. Pune city has emerged as not only an educational hub but also major prominent location for IT and Automobile Industry. The city covers 331.26 Sq. Km Area. Pune is second largest city in Maharashtra after Mumbai and ninth in India. Its estimated population is 69, 87,077 and density 5,600/ sq. Km. Pune is the fastest growing city in Asia-Pacific region. The city has shown 40% decadal growth rate in 40 years. (World Population Review, 2022)

Objectives of Study

1. To study solid waste management practices in Pune Municipal Corporation
2. Find out various sustainable practices in Pune Municipal Corporation
3. To find out effects of sustainable solid waste management practices on human, environment and economy.

Research Methods

The data regarding solid waste management is collected from official website of Pune Municipal Corporation, Maharashtra Pollution Control Board and reports of National Institute of Urban Affairs. Secondary data is used to understand solid waste management in study area. Tables, charts are prepared for better illustration and understanding.

Solid waste management consist of series of tests such as collection of waste, segregation of waste on its basis of nature, transporting carefully and labeling them, undergoing various type of treatment in order to reduce its hazardous effect and disposing it by burning, burying and recycling methods etc. this steps prevent the spread of pollution, reduce the hazardous effects and keep the environment clean. So the environment become good habitat for all living beings. (Vijayalakshmi, 2020)Pune Municipal Corporation has started environment friendly activities like Zero Garbage Model, plastic waste management, competition in Prabhag level to promote cleanliness. The present work focus on solid waste management at different level collection, segregation, disposing treatment and landfilling. (Vijayalakshmi, 2020) Author has made critical review on Modern Solid waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, landfilling, incineration, biomethenation and waste to energy.

Solid Waste generation in Pune Municipal Corporation

It has been estimated that PMC generated 1300 to 1400 MTD solid waste. Per capita waste generation is 450 to 500 gram per capita per day. The PMC is divided in 15 Administrative wards each wards generate average solid waste ranging from

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...gram per day Solid waste segregation in Pune ...pal Corporation.

...is India's first wholly owned cooperative of ...ployed waste collectors and other urban poor. It is an ...nous enterprises that provides front end management ...e to the citizen of Pune. SWaCH Cooperative plays ...role in solid waste collection in Pune city. SWaCH has ...taken various innovative program from for waste ...ction like V-Collect, waste collection at events, ...ctives, MLP Collection and Nirmalya collection.

...llect

...H cooperative collects unused house items, clothes, ...books, furniture, bicycle, kitchen utensils, clothe, shoes ...other discarded material through V-Collect Drive and ...from collection bins.

...aste Collection Drive

...less batteries, mobile phones, charger and other ...ronic materials are collected through E-Waste Collection ...e SWACH organizes E-Collection Drive in society ...ter it is separated by SWACH workers. The cooperative is ...orized by pollution control board and Pune Municipal ...poration for waste collection. The collection points and ...s are set up in many colleges, school, campuses, offices, ...pping malls etc. SWACH has collected 3.95 tons Waste in ...4 and it reached at 9.19 in 2019. From 2014 to 2019 ...ACH collected almost 36.57 Tons of Electronic waste. ...ACH, 2022)

...d Dot Campaign

...Pune city has introduced Red Dot Campaign, where ...ens, Worker and administrative unanimously accepted ...responsibility making it lesson for other cities in India. ...is achieved through well planned mechanism of ...ection, channelization and disposal. The ...administration is in process of exploring a state-...-technology to make value added products from the ...tary waste. SWaCH origination's worker are collecting ...e from door to door and bring their waste to feeder point. ...y feeder point is operated by five to seven worker who ...n waste collection services to 100 to 150 households ...The waste then collected by PMC vehicle is transported ...nsfer station. Sanitary waste is transfer in red container, ...ch is then carried to processing facility. The installation ...nitary processing is started in 2019. The plant is ...osed to have a capacity 10 Tons per day of sanitary ...te (Atin Biswas, Subhasis Parida et. al. , 2021, p. 23)

...regation

...te are classified in to three types on basis of physical ...e, biodegradability and effects on human health. On the ...sical state further it classified in to solid (seen by naked ...), liquid (home and industrial effluents) and gaseous (not seen by naked eyes). On the basis of biodegradability it is divided in biodegradable (organic) and non-biodegradable (Metal, plastic, paper and glass). On the basis of effects on human health it is classified as hazardous (dangerous) and non- hazardous (non-dangerous) (Vijayalakshmi, 2020)

Segregation is very important process in Solid Waste Management. Here SWACH collects all waste by door to door collection method. Also they arrange V-Collect drive and E-Collection drives in Society, Colleges, Schools and offices. The waste collected from various places is segregated by workers. All waste is not same some is usable and other is not so all types of clothes, books, furniture, electronic device, plastic material are very carefully segregated. Over a time period SWACH has improved its segregation process and workers are more efficient which has made possible to generate resources from 0.5 Tons in 2008 to 40 Tons in 2022 and 12 Tons electronic Waste annually. (SWACH, 2022)

Biogas generation: 4R Principle

Pune Municipal corporation has become role model when it comes to waste disposal the city follow 4R principle that is Reduce, Reuse, Recycle and Recover where city As a part of it food waste generated by bulk user such as hotel, restaurant, market is separated, reduce and recover in valuable energy by converting them in Biofuel. Adar Poonawala Clean City Movement supported the project of Biomethanation plant at Talegaon which has capacity of 300 Tons per Day. Pune Municipal Corporation has set up organic/waste collection plants such as Nobel Exchange Pune is the India's first and largest scale demonstrable Food Waste to compressed operation. Nobel Exchange has partnership with Municipal Corporation and Bus companies. National Petroleum companies for gas sale, Confederation of Indian industries, National Environment Engineering Institute and clean city movement. A few unique features of Nobel Exchange Environment Solution Pvt. Ltd. Has waste processing plant are odorless and noiseless operation with zero discharge, which is based on anaerobic digestion with water based cleaning, scrubbing and compression system that convert organic waste slurry into compressed biogas (CBG). Its byproduct is organic fertilizer it can replace chemical fertilizer. Compressed Biogas has capacity to replace conventional energy sources like LPG, diesel etc. Apart from Nobel Exchange AjinkyaBiofert and Disha Management, Mechanical Composting thermal Compost, microorganism, Biomethanation plant and Rochem separation system are also working on wet waste treatment. (Solid Waste Managemnet Department, 2022)

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Electricity Generation through Wet waste generated in Hotels in Kothrud area

Waste generated in hotel from Kothrud Ward is transported to processing plant at Bavdhan. Electricity generated through this waste is utilized to light 112 street lights on main and ancillary road in Bavdhan Area. Citizen were feared for consequences of garbage dumping but effective implementation and success people came forward to support the project. Currently 14 KW electricity is generated in this processing plants. The Kothrud ward office collects 5 MTD waste from hotel twice daily. The waste is converted to biogas which through generates lights up the street lights. The project is implemented by private company. The PMC is pays for electricity generated. PMC aims to replicate this project in other wards also. (Pune city Sanitation Plan , 2012)

Composting

Solid Waste Management Rule 2016 section 1.9 and 1.11 have made it illegal for corporations to send wet waste to landfill site. By facilitating at sources SWACH made cityzens and corporation to abide the law. SWACH provide expertise and material needed to install new infrastructure in both residential and commercial area. This includes installation of pits and portable Fiber Reinforced polymer Bins, providing the requisite coco-peat and safety material and assigning trained waste picker to maintain compost unit. SWACH helps citizen to maintain existing pits. Which makes them eligible to apply for 5% rebate on property taxes as per PMC norms. (SWACH, 2022)

Zero Garbage Model

Janwani and MITCON Institute of Management undertook an intensive study in Katraj Ward. SWaCH Cooperative help them with trained waste picker. Waste pickers were trained in handling non-recyclable garbage. PMC along with partner cumin launched ' SwatchtaMitra' a cleanliness campaign that involve local citizen. Puppet shows helped to educate resident about garbage segregation. The PMC tried hard to alter the behavior of the citizen by continuous efforts. PMC removed community garbage bins in the area, it forced resident to use door to door collection instead of dropping waste in community bins. A biogas plant was opened in Katraj that uses the organic waste to generate electricity to power street lights. A plant to create fuel pullets that can be used in industrial furnaces is being experimented. (Pune Municipal Corporation website)

Land filling

Maharashtra Pollution Control Board (MPCB) issued a notice to Pune Municipal Corporation for non-compliance of solid waste at landfill site. PMC has been warned against dumping fresh garbage at landfill site. According to MPCB they have notice on their visit along with PMC to landfill site on 3rd March 2022 that PMC is processing fresh 250 to 300 Metric tons waste. It is observed that leachate treatment provided in not adequate and huge quantity is flowing through without treatment in the nallah. As the untreated leachate mixing in the water its creates the problem of water pollution in surrounding area. MPCB has warned PMC to stop the processing fresh solid waste in bio mining plant at UraliDevachi immediately. Recently resident at UraliDevachi and Phursungi had demanded permanent closure of garbage depot at their neighborhood. (Hindustan Times , 2022)

Pune Municipal Corporation and Pune Cantonment Board jointly approved the project of 100 Metric Tonne Processing plant and sanitary landfill project located in Hadapsar Estate. 10 acre land is given to PMC for 10 years. The board is required to provide proper scientific treatment for old waste lying at trenching ground in Hadapsar, As per section 5 of Environment Protection Act 1986 and Solid Waste Management Rule (2016)(Nadeem Inamdar, 2022)

Observation

It has been observed that Pune Municipal Corporation has good partnership with his stake holder like Adar Poonawala, SWACH cooperative, KagadKachPatraKashtakari Panchayat, Janwani Foundation etc., people's participation is also important in solid waste management. Here SWACH Cooperative played very impressive role to convince people for waste segregation, door to door collection, composting waste, red dot campaign and many more. Zero waste model is one of the popular model by PMC but it is not implemented fully in other wards more than Katraj. Though the PMC have done many progressive management practices in the region like Biomethenation, composting in societies and private composting, biogas generation and electricity generation from wet waste from hotels they are facing problem related to landfill and till date PMC is sending 250 to 300 Metric Tons of fresh solid waste to landfill site.

Result:

PMC and its stake holders are practicing various innovative sustainable practices in the city.

1. The solid waste Management Department of PMC is working with SWACH Cooperative for solid waste management. SWACH is responsible for door to door collection of waste, segregation and process. PMC is looking after transportation and landfilling.
2. PMC, SWACH Cooperative and Janawani Foundation are doing many sustainable practices in PMC region like Door to Door Collection, V-Collect, E-Collect, Compost project in societies, Red dot Campaign.
3. Private stake holder are also involved in solid waste management in PMC like Adar Poonawala Clean city Movement, Nobel Exchange AjinkyaBiofert and Disha Management. They have played major role in electricity generation out of the solid waste.
4. People's participation is very important in solid waste management. Citizen have adopted to healthy practices like waste segregation, door to door waste collection and

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participated in Red Dot Campaign. It has created positive effect on society.

According to SWACH Impact they have collected 39, 85, 81,000 Tons waste annually and 18% waste is diverted from reaching to landfill site it is 7, 17, 44,400 Tons annually. It helps them to reduce Green House Gas 1, 84,609 Metric Ton. The material collected from V- collect and E-Collect is processed carefully and later it is sold to needy people at very low price or diverted for further processing it helps to save lot of natural resources which were used during manufacturing. Pune Municipal Corporation and Pune Cantonment Board jointly approved the project of 100 Metric Tonne Processing plant and sanitary landfill project located in Hadapsar Estate. 10 acre land is given to PMC for 10 years. The board is required to provide proper scientific treatment for old waste lying at trenching ground in Hadapsar. As per section 5 of Environment Protection Act 1986 and Solid Waste Management Rule (2016)(Nadeem Inamdar, 2022)

Discussion

PMC and its stake holders are heading towards sustainable solid waste management. They are providing employment opportunity to waste pickers, diverting waste to usable thing also generate electricity and compost out of the waste but still lot of wet waste is going to landfill site. PMC should focus to enhance on sustainable solid waste management practices to divert waste from landfill site to usable material or energy.

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Numerical Solution for the Heat Equation Using Forward Time Centered Space Difference Method

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Abstract: ***In this paper, the forward time centered space is applied to a simple problem involving one dimensional heat equation. Numerical solution to the heat equation using forward time centered space difference equation is obtained. The method of solving the problem is implemented by using Python Programming. We have discussed the local truncation error and stability analysis of explicit forward time centered space difference method of heat equation.***
Keywords: Heat equation, Forward Time Centered space, Matrix equation, Boundary conditions, Truncation error, Stability analysis.

I. INTRODUCTION

The Heat diffusion equation is a parabolic partial differential equation which describes the heat distribution in a given region and provides the basic tool for heat conduction analysis. Analytical and Numerical methods have gained the interest of researchers for finding approximate solution to partial differential equations. Numerical Methods have applied to calculate the approximate solutions using Finite Difference Method.

Xiao-Jun Yang and Feng Gao have proposed a new technology for combining the variation of iterative method and an integral transforms for solution of diffusion and heat equation for the first time. The authors have found that the method is accurate and efficient in development of approximate solutions for the partial differential equations [1]. Alice Gorguis and Wai Kit Benny Chan have investigated a comparative study between the separation of variables and the Adomian method for heat equation. The study shows that Adomian has significant advantages and the method provides fast convergent series that gives exact solution for heat equation over the existing techniques [2]. Gerald W. Recktenwald provided a practical overview of numerical solutions to the heat equation using the finite difference method. The forward time centered space and the backward time centered space applied to a simple problem involving one dimensional differential heat equation. MATLAB codes were used to implement the differences between forward time centered space and backward time centered space [3].

Clint N.Dawson, Qiang DU and Todd F. Dupont have presented a domain decomposition algorithm for numerical solution of heat equation [4]. Abdulla-Al-Mamun et al. have obtained the analytical solution using MATLAB program by considering second order heat equation [5]. Jesus Martin-Vaqueno and Svajunas Sajavicius have demonstrated that the explicit forward time centered space scheme can be stable while some implicit methods such as Crank-Nicolson are unstable [6]. Hooshmandasl M.R., et al. have applied operational matrices of integration to get numerical solution of the one dimensional heat equation with Dirichlet boundary conditions. They have concluded that the use of Chebyshev wavelets is found to be accurate, simple and fast [7]. Tahrich N.A.Shahid et al. have investigated that modified difference equation in specific problems are more convenient for discussing the solution behavior including physical interpretation of accuracy, stability and consistency [8]. Jeffry Kusuma et al. have described a numerical solution for mathematical model of the transport equation in a simple rectangular box domain. Their mathematical model with various advection and diffusion parameters and boundary conditions is also solved numerically using finite difference forward time centered space method [9].

Wahida Zaman Loksar and Rama Sarkar have considered one dimensional heat equation as an initial boundary value problem for different materials. The forward time centered space is used with the stability conditions. The results were obtained by using MATLAB codes [10].

Hamzeh Zureigat et al. have discussed about an explicit finite difference scheme such as the forward time centered space was implemented to solve the complex fuzzy heat equations. The stability of the proposed approach indicated that the forward time centered space scheme was conditionally stable [11]. This paper proposes the numerical solution for the heat equation using forward time centered space by Python programming. The paper is organized as follows: Section II presents the heat equation, Section III discusses the discrete grid, Section IV focuses on implementation and results, Section V discusses local truncation error, Section VI focuses on stability analysis and finally the conclusion is presented in Section VII.

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II. THE HEAT EQUATION

The heat equation is the first order in time (t) and second order in space (x) partial differential equation

$$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} \dots\dots\dots\dots (1)$$

where $u = u(x,t)$ is the dependent variable. The equation describes heat transfer on a domain

$$\Omega = \{t \geq 0; 0 \leq x \leq 1\} \dots\dots\dots\dots . (2)$$

With an initial condition at time $t = 0$ for all x and boundary condition on the left $x = 0$ and right side $x = 1$.

The forward time centered space difference method for the heat equation with the initial conditions by considering the equation

$$u(x,0) = \begin{cases} 2x; & 0 \leq x \leq \frac{1}{2} \\ 2(1-x); & \frac{1}{2} \leq x \leq 1 \end{cases} \dots\dots\dots\dots\dots (3)$$

and boundary conditions $u(0,t) = 0 \; and \; u(1,t) = 0$.

III. THE DISCRETE GRID

The region Ω discretized into a uniform mesh Ω_h. The discrete values of x are uniformly spaced in the interval $0 \leq x \leq 1$. In the space x direction into N steps giving a step size of $h = \frac{1-0}{N}$, resulting in $x[i] = 0 + ih, i = 0,1,2, \dots\dots\dots, N$ and into N_t steps in the time t direction giving a step size of $k = \frac{1-0}{N_t}$ resulting in $t[j] = 0 + jk, j = 0,1,2, \dots\dots\dots, 15$.

The Figure 1 below shows the discrete grid points for $N = 10 \; and \; N_t = 100$, the known boundary conditions (Green), initial conditions (Blue) and the unknown values (Red) of the heat equation.

$$N = 10; \quad h = \frac{1}{N} = \frac{1}{10} = 0.1$$

$$N_t = 1000; \quad k = \frac{1}{N_t} = \frac{1}{1000} = 0.001$$

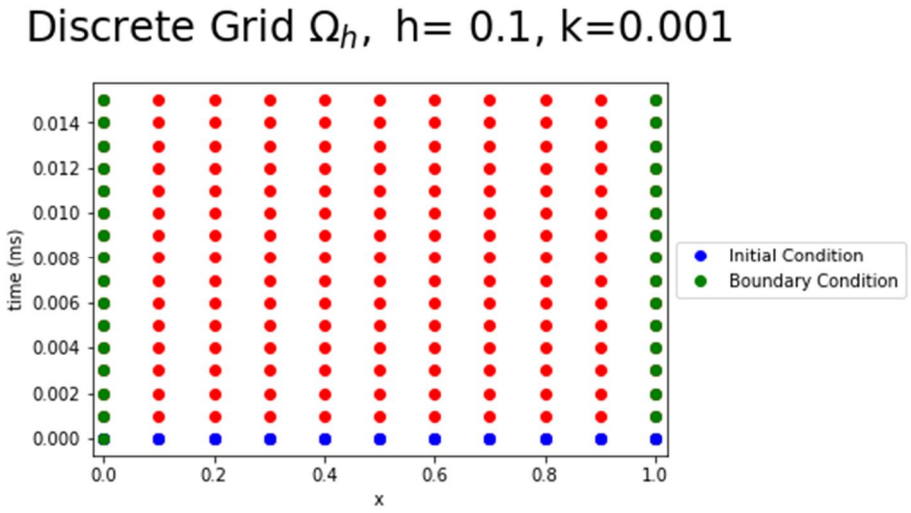

Figure 1.Discrete Grid points for initial and boundary conditions.

Discrete initial and boundary conditions:

The discrete initial conditions are

$$w[i,0] = \begin{cases} 2x[i]; & 0 \leq x[i] \leq \frac{1}{2} \\ 2(1-x[i]); & \frac{1}{2} \leq x[i] \leq 1 \end{cases} \dots\dots\dots\dots . (4)$$

and the discrete boundary conditions $w[0,j] = 0 \; and \; w[10,j] = 0$, where $w[i,j]$ is the numerical approximation of $U(x[i],t[j])$.

The Figure 2 below plots the values of $w[i,0]$ for the initial (blue) and boundary (green) conditions for $t[0] = 0$.

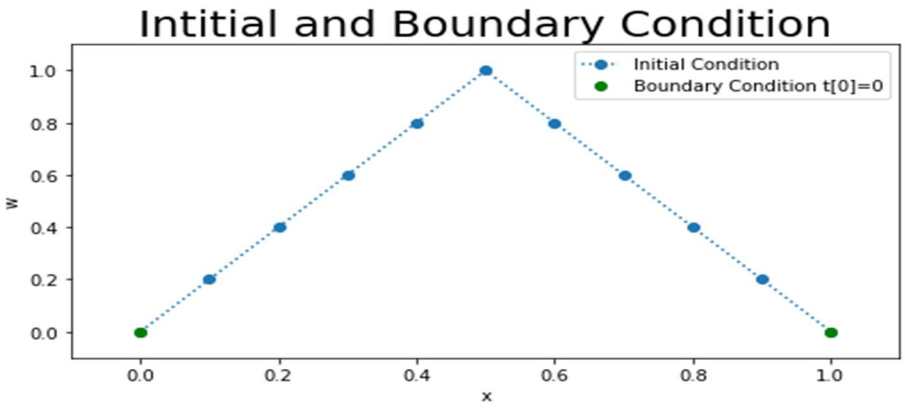

Figure 2.Plot of initial and boundary conditions for $t[0] = 0$.

The explicit forward time centered space difference equation of the heat equation is derived by discretizing around (x_i, t_j)

$$\frac{\partial u_{ij}}{\partial t} = \frac{\partial^2 u_{ij}}{\partial x^2} \dots\dots\dots\dots (5)$$

The difference equation is given by

$$\frac{w_{ij+1} - w_{ij}}{k} = \frac{w_{i+1j} + w_{i-1j} - 2w_{ij}}{h^2} \dots\dots\dots\dots\dots (6)$$

Rearranging the equation (6) we obtain,

$$w_{ij+1} - w_{ij} = \frac{k[w_{i+1j} + w_{i-1j} - 2w_{ij}]}{h^2}$$

$$w_{ij+1} - w_{ij} = r[w_{i+1j} + w_{i-1j} - 2w_{ij}] \quad for\ i = 1,2,\dots\dots,9\ where\ r = \frac{k}{h^2}$$

$$w_{ij+1} = w_{ij}(1-2r) + rw_{i-1j} + rw_{i+1j} \dots\dots\dots\dots\dots (7)$$

This gives the formula for unknown term w_{ij+1} at the $(ij + 1)$- mesh points in terms of $x[i]$ along the jth time row. Hence we can calculate the unknown pivotal values of w along the first row of $j = 1$ in terms of the known boundary conditions [12].

This can be written in the equation of matrix form $w_{j+1} = Aw_j + b_j \dots\dots\dots\dots (8)$

where A is a 9×9 matrix.

$$\begin{bmatrix} w_{1j+1} \\ w_{2j+1} \\ w_{3j+1} \\ w_{4j+1} \\ w_{5j+1} \\ w_{6j+1} \\ w_{7j+1} \\ w_{8j+1} \\ w_{9j+1} \end{bmatrix} = \begin{bmatrix} 1-2r & r & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ r & 1-2r & r & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & r & 1-2r & r & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & r & 1-2r & r & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & r & 1-2r & r & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & r & 1-2r & r & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & r & 1-2r & r & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & r & 1-2r & r \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & r & 1-2r \end{bmatrix} \begin{bmatrix} w_{1j} \\ w_{2j} \\ w_{3j} \\ w_{4j} \\ w_{5j} \\ w_{6j} \\ w_{7j} \\ w_{8j} \\ w_{9j} \end{bmatrix} + \begin{bmatrix} rw_{1j} \\ rw_{2j} \\ rw_{3j} \\ rw_{4j} \\ rw_{5j} \\ rw_{6j} \\ rw_{7j} \\ rw_{8j} \\ rw_{9j} \end{bmatrix}$$

It is assumed that the boundary values are known for $j = 1,2,\dots\dots and\ for\ i = 0,1,2,\dots\dots\dots$ is the initial condition. The Figure 3 below shows the values of the 9×9 matrix in colour plot form for $r = \frac{k}{h^2}$.

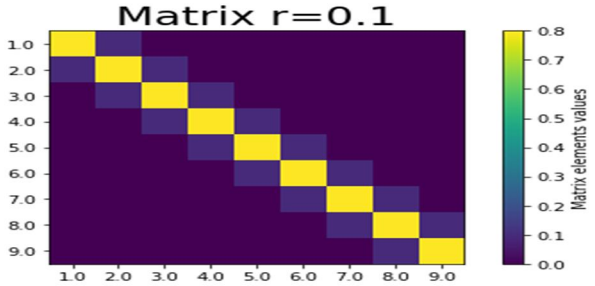

Figure 3.The values of the matrix of order 9×9

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IV. IMPLEMENTATION AND RESULTS

To approximate the solution numerically at $t[1]$, the matrix equation becomes $w_1 = Aw_0 + b_0$ where all the right hand side is known. To approximate the solution numerically at $t[2]$, the matrix equation becomes $w_2 = Aw_1 + b_1$ where all the right hand side is known. To approximate the solution numerically at $t[3]$, the matrix equation becomes $w_3 = Aw_2 + b_2$ where all the right hand side is known. To approximate the solution numerically at $t[4]$, the matrix equation becomes $w_4 = Aw_3 + b_3$ where all the right hand side is known and so on. Each set of numerical solution $w[i,j]$ for all i at the previous time step is used to approximate the solution $w[i,j+1]$. The Figure 4 below shows the numerical approximation $w[i,j]$ of the heat equation using the forward time centered space at

$x[i]\ for\ i = 0,1,2,\ldots\ldots\ldots,10$ *and time steps* $t[j]\ for\ j = 1,2,3,\ldots\ldots\ldots,15.$

The left plot shows the numerical approximation $w[i,j]$ as a function of $x[i]$ with each colour representing the different time steps $t[j]$.

The right plot shows the numerical approximation $w[i,j]$ as colour plot as a function of $x[i]$ on the X - axis and time $t[j]$ on the Y-axis.

For $r > \frac{1}{2}$, the method is unstable and results a solution that oscillates unnaturally between positive and negative values for each time step. Stable solutions with the forward time centered space scheme are obtained only if $r < \frac{1}{2}$.

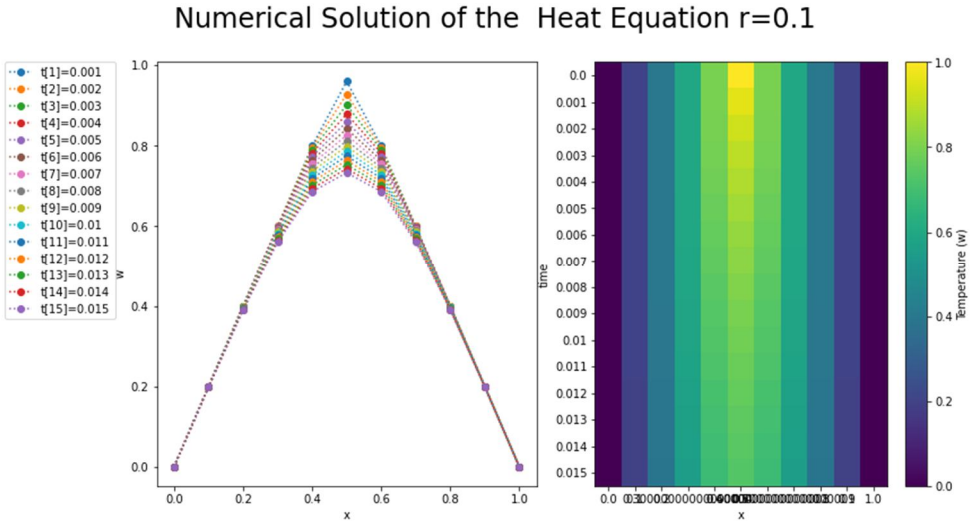

Figure 4.Numerical approximation $w[i,j]$ of the heat equation using the forward time centered space method.

V. TRUNCATION ERROR

The local truncation error of the classical explicit difference approach to the equation

$$\frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} = 0\ with$$

$$V_{ij}(w) = \frac{w_{ij+1} - w_{ij}}{k} - \frac{w_{i+1j} + w_{i-1j} - 2w_{ij}}{h^2} = 0$$

$$Let\ T_{ij} = V_{ij}(U) = \frac{U_{ij+1} - U_{ij}}{k} - \frac{U_{i+1j} + U_{i-1j} - 2U_{ij}}{h^2} \ldots\ldots\ldots\ldots \quad (9)$$

By Taylor's expansion, we have

$$U_{i+1j} = U\big((i+1)h, jk\big)$$

$$U_{i+1j} = U\big(x_i + h, t_j\big)$$

$$U_{i+1j} = U_{ij} + h\left(\frac{\partial U}{\partial x}\right)_{ij} + \frac{h^2}{2}\left(\frac{\partial^2 U}{\partial x^2}\right)_{ij} + \frac{h^3}{6}\left(\frac{\partial^3 U}{\partial x^3}\right)_{ij} + \cdots \quad (10)$$

$$U_{i-1j} = U\big((i-1)h, jk\big)$$

$$U_{i-1j} = U\big(x_i - h, t_j\big)$$

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$$U_{i-1j} = U_{ij} - h\left(\frac{\partial U}{\partial x}\right)_{ij} + \frac{h^2}{2}\left(\frac{\partial^2 U}{\partial x^2}\right)_{ij} - \frac{h^3}{6}\left(\frac{\partial^3 U}{\partial x^3}\right)_{ij} + \cdots \quad (11)$$

$$U_{ij+1} = U(ih, (j+1)k)$$

$$U_{ij+1} = U(x_i, t_j + k)$$

$$U_{ij+1} = U_{ij} + k\left(\frac{\partial U}{\partial t}\right)_{ij} + \frac{k^2}{2}\left(\frac{\partial^2 U}{\partial t^2}\right)_{ij} + \frac{k^3}{6}\left(\frac{\partial^3 U}{\partial t^3}\right)_{ij} + \cdots \quad (12)$$

Substituting (10), (11) and (12) in (9), we obtain

$$T_{ij} = \left(\frac{\partial U}{\partial t} - \frac{\partial^2 U}{\partial x^2}\right)_{ij} + \frac{k}{2}\left(\frac{\partial^2 U}{\partial t^2}\right)_{ij} - \frac{h^2}{12}\left(\frac{\partial^4 U}{\partial x^4}\right)_{ij} + \frac{k^2}{6}\left(\frac{\partial^3 U}{\partial t^3}\right)_{ij} - \frac{h^4}{360}\left(\frac{\partial^6 U}{\partial x^6}\right)_{ij} + \cdots$$

But U is the solution of the differential equation

$$\left(\frac{\partial U}{\partial t} - \frac{\partial^2 U}{\partial x^2}\right)_{ij} = 0$$

The principal part of local truncation error is

$$\frac{k}{2}\left(\frac{\partial^2 U}{\partial t^2}\right)_{ij} - \frac{h^2}{12}\left(\frac{\partial^4 U}{\partial x^4}\right)_{ij}$$

Hence the truncation error is $T_{ij} = O(k) + O(h^2)$ ... ... (13)

VI. STABILITY ANALYSIS

To discuss the stability of the explicit forward time centered space difference method of the heat equation, we will use the von Neumann method. The forward time centered space difference equation is

$$\frac{w_{ab+1} - w_{ab}}{k} = \frac{w_{a+1b} + w_{a-1b} - 2w_{ab}}{h^2} \ldots\ldots\ldots\ldots (14)$$

Approximating $\frac{\partial U}{\partial t} = \frac{\partial^2 U}{\partial x^2}$ at (ah, bk)

Substituting $w_{ab} = \alpha^b e^{i\beta x}$ into the difference equation, we obtain

$$\alpha^{b+1} e^{i\beta ah} - \alpha^b e^{i\beta ah} = r\{\alpha^b e^{i\beta(a-1)h} - 2\alpha^b e^{i\beta ah} + \alpha^b e^{i\beta(a+1)h}\} \; where\; r = \frac{k}{h^2}$$

Dividing by $\alpha^b e^{i\beta ah}$, we obtain $\alpha - 1 = r\left[e^{i\beta h} + e^{-i\beta h} - 2\right]$

$$\Rightarrow \alpha = 1 + r[2cos\beta h - 2]$$

$$\alpha = 1 + 2r[cos\beta h - 1]$$

$$\alpha = 1 - 4r\left[sin^2\left(\frac{\beta h}{2}\right)\right]$$

Hence

$$\left|1 - 4r\left[sin^2\left(\frac{\beta h}{2}\right)\right]\right| \leq 1$$

$$\Rightarrow 4r\left[sin^2\left(\frac{\beta h}{2}\right)\right] \leq 2$$

$$\Rightarrow r \leq \frac{1}{2}$$

The equation is conditionally stable as $0 < \alpha \leq 1 \; for\; r < \frac{1}{2} \; and \; for \; all \; \beta$.

VII. CONCLUSION

We first introduced the one-dimensional heat equation to obtain the numerical approximation using forward time centered space difference method. We have proposed the initial value problem with boundary conditions to find the numerical solution. The region is discretized into a uniform mesh.

The solution is obtained by implementing Python programming by using initial and boundary conditions. The numerical solution for the heat equation is shown in Figure 4. We have investigated the local truncation error and stability analysis of the forward time centered space difference method of the heat equation.

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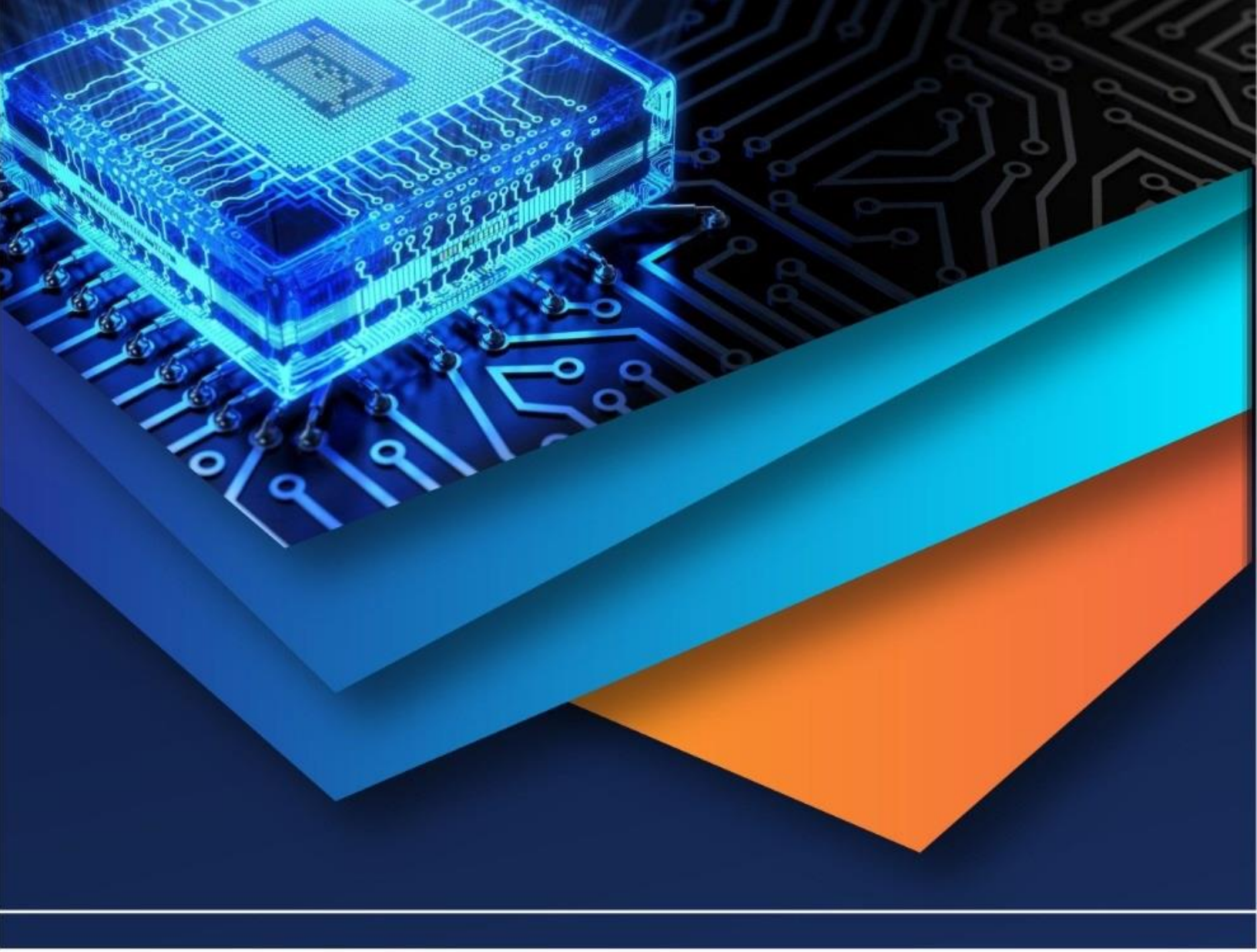

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Numerical Solution for the Heat Equation Using Crank-Nicolson Difference Method

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Abstract: ***In this paper, the Crank-Nicolson difference method is applied to a simple problem involving one dimensional heat equation. Numerical solution to the heat equation using Crank-Nicolson difference equation is obtained. The method of solving the problem is implemented by using Python Programming. We have discussed the local truncation error and stability analysis of Crank-Nicolson difference method difference method of heat equation.***
Keywords: Heat Equation, Crank-Nicolson Difference Equation, Matrix Equation, Boundary Conditions, Truncation Error, Stability Analysis.

I. INTRODUCTION

The heat diffusion equation is a parabolic partial differential equation which describes the heat distribution in a given region and provides the basic tool for heat conduction analysis. The heat equation is used to solve problems arising in the field of Engineering, Fluid Mechanics, Atmospheric Science, Climate Physics, Weather Forecasting and Solar Physics. Analytical and Numerical methods have gained the interest of researchers for finding approximate solution to partial differential equations. Numerical Methods have applied to calculate the approximate solutions using Crank-Nicolson difference method. The Crank-Nicolson method for solving heat equation was developed by John Crank and Phyllis Nicolson in 1947. This method is for numerically evaluating the partial differential equations which gives the accuracy of a second order approach in both space and time with the stability of an implicit method.

Liu J. and Hao Y. have applied the Crank-Nicolson difference method to obtain an analytical solution of uncertain heat equation. Besides, the two algorithms are investigated to compute two characteristics of uncertain heat equation solution the expected value and the extreme value with various examples [1]. Umar Ali et al. have described the Crank-Nicolson difference method for two – dimensional sub diffusion equation. They have found that the scheme is convergent and it is unconditionally stable. The result shows that the scheme is feasible and accurate [2]. Halil ANAC et al. have successfully applied Crank-Nicolson difference method to solve a random component heat equation. They have obtained the expected value and variance of this solution. The numerical solution shows that this method is very effective by implementing MAPLE software [3]. Cem Celik and Melda Duman have applied Crank-Nicolson difference method to a linear fractional diffusion equation and proved that the method is unconditionally stable and convergent. The numerical solution shows that the accuracy by using simulation method [4]. Chen Jing had developed for a one-dimensional and two-dimensional diffusion equation for Crank-Nicolson difference method. The alternating block technique is further extended to a three-dimensional space diffusion equation and he found that the new method is suitable to MIMD computers [5]. Fadugba S. E. et al. have demonstrated that the Crank-Nicolson difference method performs well and provides better accuracy for exact solution. This method is robust, unconditionally stable and converges faster than the two finite difference methods FTCS and BCTS [6]. Omar Abdullah Ajeel and A.M.Gaftan have solved the heat diffusion problem by using Crank-Nicolson difference method and ADI numerical method. Both the results were compared and it reveals that Crank-Nicolson difference method is more accurate than the ADI method [7].

F. Jamaluddin et al. have solved the homogeneous one-dimensional heat equation by using Implicit Crank-Nicolson difference method. The results are compared with analytical solution and exact solution. The results are very precise or remain the same as exact solution [8]. H. Zureigat et al. have obtained the results using Crank-Nicolson difference method satisfy the complex fuzzy number properties by taking the triangular fuzzy number shape for both the real part and imaginary part and have an accuracy. Further, it was found that the complex fuzzy approach is general and computationally efficient to transfer the information that happens periodically [9].

Irfan Raju et al. have proposed to solve the two-dimensional heat equation with initial conditions by using Crank-Nicolson difference method. They have suggested that the Digital Image Processing can be a valuable tool for numerical modeling of the heat equation by using MATLAB Codes [10].

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S. K. Maritim had proposed that the modified Crank-Nicolson difference method produces more accurate results and unconditionally stable as compared to the ordinary Crank-Nicolson difference method [11]. This paper proposes the numerical solution for the heat equation using Crank-Nicolson difference method by Python programming. The paper is organized as follows: Section II presents the heat equation, Section III discusses the discrete grid, Section IV discusses the Discrete Initial and Boundary conditions, Section V presents the Crank- Nicolson difference method, Section VI focuses on implementation and results, Section VII discusses local truncation error, Section VIII focuses on stability analysis and finally the conclusion is presented in Section IX.

II. THE HEAT EQUATION

The heat equation is the first order in time (t) and second order in space (x) partial differential equation

$$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} \dots\dots\dots\dots (1)$$

where $u = u(x,t)$ is the dependent variable. The equation describes heat transfer on a domain

$$\Omega = \{t \geq 0; 0 \leq x \leq 1\} \dots\dots\dots\dots . (2)$$

With an initial condition at time $t = 0$ for all x and boundary condition on the left $x = 0$ and right side $x = 1$.

We will implement the Crank-Nicolson difference method for the heat equation with the initial conditions by considering the equation

$$u(x,0) = \begin{cases} 2x; & 0 \leq x \leq \frac{1}{2} \\ 2(1-x); & \frac{1}{2} \leq x \leq 1 \end{cases} \dots\dots\dots\dots\dots (3)$$

and boundary conditions $u(0,t) = 0 \; and \; u(1,t) = 0$.

III. THE DISCRETE GRID

The region Ω discretized into a uniform mesh Ω_h. The discrete values of x are uniformly spaced in the interval $0 \leq x \leq 1$. In the space x direction into N steps giving a step size of $h = \frac{1-0}{N}$, resulting in $x[i] = 0 + ih, i = 0,1,2, \dots\dots\dots, N$ and into N_t steps in the time t direction giving a step size of $k = \frac{1-0}{N_t}$ resulting in $t[j] = 0 + jk, j = 0,1,2, \dots\dots\dots, 15$. The Figure 1 below shows the discrete grid points for $N = 10 \; and \; N_t = 100$, the known boundary conditions (Green), initial conditions (Blue) and the unknown values (Red) of the heat equation.

$$N = 10; \quad h = \frac{1}{N} = \frac{1}{10} = 0.1; \quad N_t = 100; \quad k = \frac{1}{N_t} = \frac{1}{100} = 0.01$$

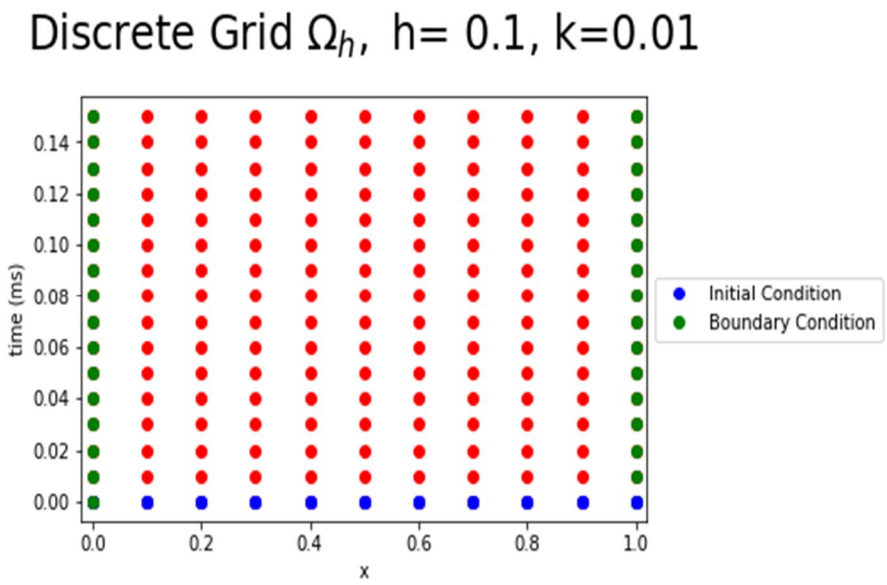

Figure 1.Discrete Grid points for initial and boundary conditions.

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IV. DISCRETE INITIAL AND BOUNDARY CONDITIONS

The discrete initial conditions are

$$w[i,0] = \begin{cases} 2x[i]; & 0 \le x[i] \le \frac{1}{2} \\ 2(1-x[i]); & \frac{1}{2} \le x[i] \le 1 \end{cases} \dots\dots\dots\dots (4)$$

and the discrete boundary conditions $w[0,j] = 0$ *and* $w[10,j] = 0$, where $w[i,j]$ is the numerical approximation of $U(x[i],t[j])$. The Figure 2 below plots the values of $w[i,0]$ for the initial (blue) and boundary (green) conditions for $t[0] = 0$.

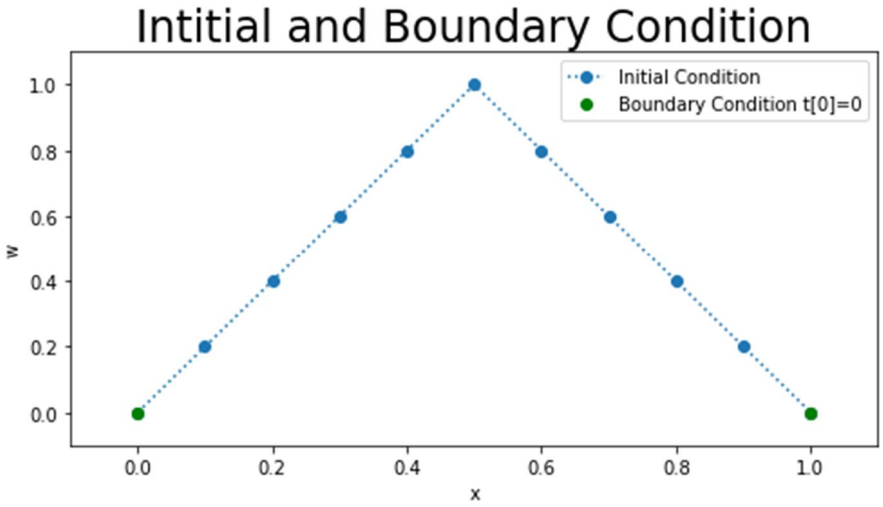

Figure 2.Plot of initial and boundary conditions for $t[0] = 0$.

V. THE CRANK-NICOLSON DIFFERENCE METHOD

The implicit Crank-Nicolson difference equation of the heat equation is derived by discretizing around $(x_i, t_{j+\frac{1}{2}})$

$$\frac{\partial u_{ij+\frac{1}{2}}}{\partial t} = \frac{\partial^2 u_{ij+\frac{1}{2}}}{\partial x^2} \dots\dots\dots\dots (5)$$

The difference equation is given by

$$\frac{w_{ij+1} - w_{ij}}{k} = \frac{1}{2}\left\{\frac{w_{i+1j+1} + w_{i-1j+1} - 2w_{ij+1}}{h^2} + \frac{w_{i+1j} + w_{i-1j} - 2w_{ij}}{h^2}\right\} \dots\dots\dots (6)$$

Rearranging the equation (6) we obtain,

$$2(w_{ij+1} - w_{ij}) = \frac{k}{h^2}\{w_{i+1j+1} + w_{i-1j+1} - 2w_{ij+1} + w_{i+1j} + w_{i-1j} - 2w_{ij}\}$$
$$\Longrightarrow 2w_{ij+1} - 2w_{ij} = r\{w_{i+1j+1} + w_{i-1j+1} - 2w_{ij+1} + w_{i+1j} + w_{i-1j} - 2w_{ij}$$
$$\Longrightarrow -rw_{i-1j+1} + (2+2r)w_{ij+1} - rw_{i+1j+1} = rw_{i-1j} + (2-2r)w_{ij} + rw_{i+1j} \dots\dots\dots (7)$$
$$for\ i = 1,2,\dots\dots,9\ where\ r = \frac{k}{h^2}$$

This gives the formula for unknown term w_{ij+1} at the $(ij+1)$ mesh points in terms of $x[i]$ along the jth time row. Hence we can calculate the unknown pivotal values of w along the first row of $j = 1$ in terms of the known boundary conditions [12].
This can be written in the equation of matrix form $\boldsymbol{Aw_{i+j} = Bw_j + b_j + b_{j+1}}$ ..... (8)
for which A is a 9×9 matrix.

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$$\begin{bmatrix} 2+2r & -r & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -r & 2+2r & -r & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & -r & 2+2r & -r & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -r & 2+2r & -r & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -r & 2+2r & -r & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -r & 2+2r & -r & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -r & 2+2r & -r & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & -r & 2+2r & -r \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & -r & 2+2r \end{bmatrix} \begin{bmatrix} w_{1j+1} \\ w_{2j+1} \\ w_{3j+1} \\ w_{4j+1} \\ w_{5j+1} \\ w_{6j+1} \\ w_{7j+1} \\ w_{8j+1} \\ w_{9j+1} \end{bmatrix} =$$

$$\begin{bmatrix} 2-2r & r & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ r & 2-2r & r & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & r & 2-2r & r & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & r & 2-2r & r & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & r & 2-2r & r & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & r & 2-2r & r & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & r & 2-2r & r & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & r & 2-2r & r \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & r & 2-2r \end{bmatrix} \begin{bmatrix} w_{1j} \\ w_{2j} \\ w_{3j} \\ w_{4j} \\ w_{5j} \\ w_{6j} \\ w_{7j} \\ w_{8j} \\ w_{9j} \end{bmatrix} + \begin{bmatrix} rw_{0j} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ rw_{10j} \end{bmatrix} + \begin{bmatrix} rw_{0j+1} \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ rw_{10j+1} \end{bmatrix}$$

It is assumed that the boundary values w_{0j} *and* $w_{10j}$are known for $j = 1,2,\ldots\ldots$ *and* w_{i0}*for* $i = 0,1,2,\ldots\ldots\ldots,10$ is the initial condition. The Figure 3 below shows the values of the 9×9 matrix in colour plot form for $r = \frac{k}{h^2}$.

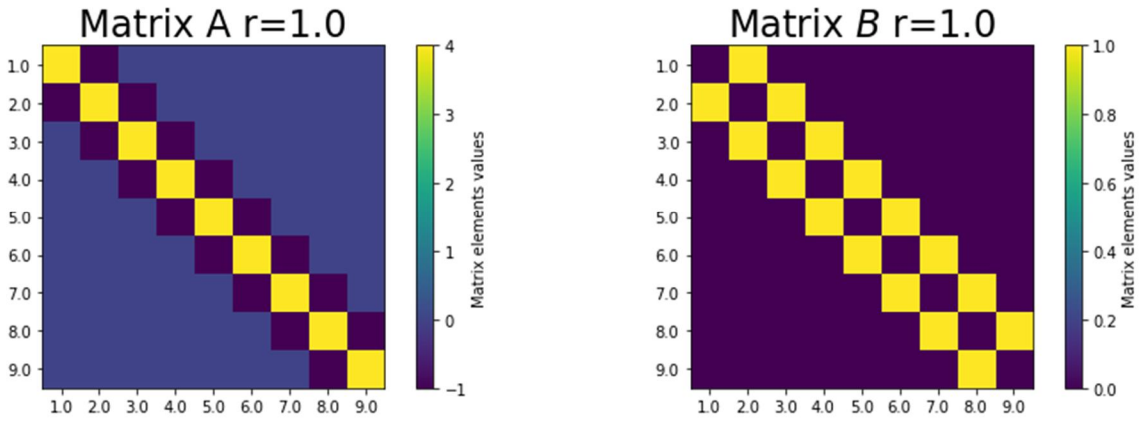

Figure 3.The values of the matrix of order 9×9

VI. IMPLEMENTATION AND RESULTS

To approximate the solution numerically at $t[1]$, the matrix equation becomes
$w_1 = A^{-1}(Bw_0 + b_1 + b_0)$ where all the right hand side is known.
To approximate the solution numerically at $t[2]$, the matrix equation becomes
$w_2 = A^{-1}(Bw_1 + b_2 + b_1)$ where all the right hand side is known.
To approximate the solution numerically at $t[3]$, the matrix equation becomes
$w_3 = A^{-1}(Bw_2 + b_3 + b_2)$ where all the right hand side is known.
To approximate the solution numerically at $t[4]$, the matrix equation becomes
$w_4 = A^{-1}(Bw_3 + b_4 + b_3)$ where all the right hand side is known and so on.
Each set of numerical solution $w[i,j]$ for all i at the previous time step is used to approximate the solution $w[i,j+1]$. The Figure 4 below shows the numerical approximation $w[i,j]$ of the heat equation using the Crank-Nicolson method at $x[i]\ for\ i = 0,1,2,\ldots\ldots\ldots,10$ *and time steps* $t[j]\ for\ j = 1,2,3,\ldots\ldots\ldots,15$.
The left plot shows the numerical approximation $w[i,j]$ as a function of $x[i]$ with each colour representing the different time steps $t[j]$.

The right plot shows the numerical approximation $w[i,j]$ as colour plot as a function of $x[i]$ on the X - axis and time $t[j]$ on the Y-axis.

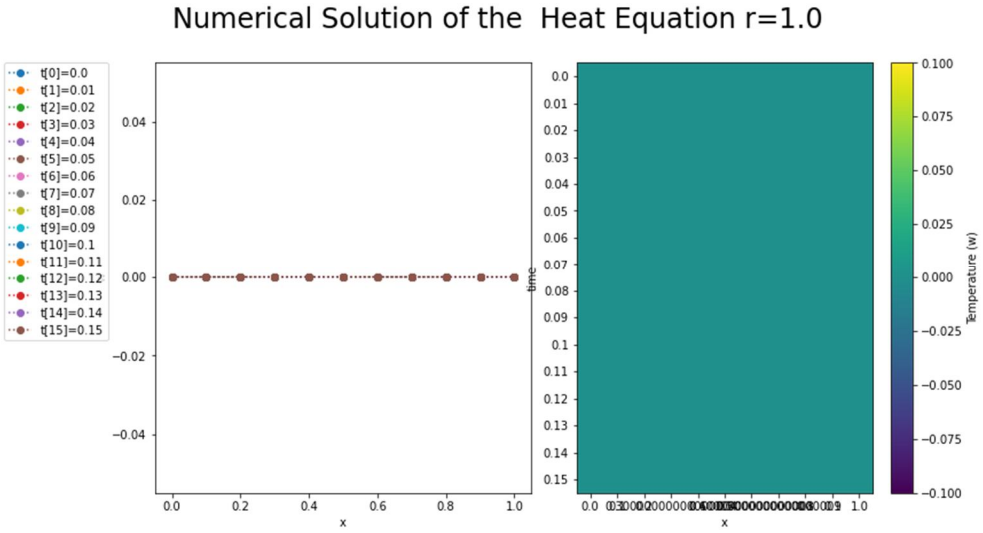

Figure 4.Numerical approximation $w[i,j]$ of the heat equation using the Crank-Nicolson method

VII. TRUNCATION ERROR

In Crank-Nicolson method, we approximate the local truncation error of the classical implicit difference approach to the equation $\frac{\partial U}{\partial t} - \frac{\partial^2 U}{\partial x^2} = 0\ with$

$$F_{ij+\frac{1}{2}}(w) = \frac{w_{ij+1} - w_{ij}}{k} - \frac{1}{2}\left\{\frac{w_{i+1j+1} + w_{i-1j+1} - 2w_{ij+1}}{h^2} + \frac{w_{i+1j} + w_{i-1j} - 2w_{ij}}{h^2}\right\} = 0$$

$Let\ T_{ij+\frac{1}{2}} = F_{ij+\frac{1}{2}}(U) =$

$$\frac{U_{ij+1} - U_{ij}}{k} - \frac{1}{2}\left\{\frac{U_{i+1j+1} + U_{i-1j+1} - 2U_{ij+1}}{h^2} + \frac{U_{i+1j} + U_{i-1j} - 2U_{ij}}{h^2}\right\} \ldots\ldots\ldots \quad (9)$$

$$U_{ij+\frac{1}{2}} = \frac{U_{ij+1} + U_{ij}}{2}$$

$$T_{ij+\frac{1}{2}} = F_{ij+\frac{1}{2}}(U) = \frac{U_{ij+1} - U_{ij}}{k} - \frac{U_{i+1j+\frac{1}{2}} + U_{i-1j+\frac{1}{2}} - 2U_{ij+\frac{1}{2}}}{h^2}$$

By Taylor's expansion, we have

$$U_{i+1j+\frac{1}{2}} = U\left((i+1)h, (j+\frac{1}{2})k\right)$$

$$U_{i+1j+\frac{1}{2}} = U\left(x_i + h, t_j + \frac{1}{2}k\right)$$

$$U_{i+1j+\frac{1}{2}} = U_{ij+\frac{1}{2}} + h\left(\frac{\partial U}{\partial x}\right)_{ij+\frac{1}{2}} + \frac{h^2}{2}\left(\frac{\partial^2 U}{\partial x^2}\right)_{ij+\frac{1}{2}} + \frac{h^3}{6}\left(\frac{\partial^3 U}{\partial x^3}\right)_{ij+\frac{1}{2}} + \cdots \quad (10)$$

$$U_{i-1j+\frac{1}{2}} = U\left((i-1)h, (j+\frac{1}{2})k\right)$$

$$U_{i-1j+\frac{1}{2}} = U\left(x_i - h, t_j + \frac{1}{2}k\right)$$

$$U_{i-1j+\frac{1}{2}} = U_{ij+\frac{1}{2}} - h\left(\frac{\partial U}{\partial x}\right)_{ij+\frac{1}{2}} + \frac{h^2}{2}\left(\frac{\partial^2 U}{\partial x^2}\right)_{ij+\frac{1}{2}} - \frac{h^3}{6}\left(\frac{\partial^3 U}{\partial x^3}\right)_{ij+\frac{1}{2}} + \cdots \quad (11)$$

$$U_{ij+1} = U(ih, (j+1)k)$$

$$U_{ij+1} = U(x_i, t_j + k)$$

$$U_{ij+1} = U_{ij+\frac{1}{2}} + \frac{k}{2}\left(\frac{\partial U}{\partial t}\right)_{ij+\frac{1}{2}} + \frac{\left(\frac{k}{2}\right)^2}{2}\left(\frac{\partial^2 U}{\partial t^2}\right)_{ij+\frac{1}{2}} + \frac{\left(\frac{k}{2}\right)^3}{6}\left(\frac{\partial^3 U}{\partial t^3}\right)_{ij+\frac{1}{2}} + \cdots \quad (12)$$

$$U_{ij-1} = U(ih,(j-1)k)$$

$$U_{ij-1} = U(x_i, t_j - k)$$

$$U_{ij-1} = U_{ij+\frac{1}{2}} - \frac{k}{2}\left(\frac{\partial U}{\partial t}\right)_{ij+\frac{1}{2}} + \frac{\left(\frac{k}{2}\right)^2}{2}\left(\frac{\partial^2 U}{\partial t^2}\right)_{ij+\frac{1}{2}} - \frac{\left(\frac{k}{2}\right)^3}{6}\left(\frac{\partial^3 U}{\partial t^3}\right)_{ij+\frac{1}{2}} + \cdots \quad (13)$$

Substituting (10), (11), (12) and (13) in (9), we obtain

$$T_{ij+\frac{1}{2}} = \left(\frac{\partial U}{\partial t} - \frac{\partial^2 U}{\partial x^2}\right)_{ij+\frac{1}{2}} - \frac{h^2}{12}\left(\frac{\partial^4 U}{\partial x^4}\right)_{ij+\frac{1}{2}} + \frac{k^2}{24}\left(\frac{\partial^3 U}{\partial t^3}\right)_{ij+\frac{1}{2}} - \frac{h^4}{360}\left(\frac{\partial^6 U}{\partial x^6}\right)_{ij+\frac{1}{2}} + \cdots$$

But U is the solution of the differential equation $\left(\frac{\partial U}{\partial t} - \frac{\partial^2 U}{\partial x^2}\right)_{ij+\frac{1}{2}} = 0$

The principal part of local truncation error is

$$\frac{k^2}{24}\left(\frac{\partial^3 U}{\partial t^3}\right)_{ij+\frac{1}{2}} - \frac{h^2}{12}\left(\frac{\partial^4 U}{\partial x^4}\right)_{ij+\frac{1}{2}}$$

Hence the truncation error is $T_{ij} = O(k^2) + O(h^2)$ ... ... (14)

VIII. STABILITY ANALYSIS

To discuss the stability of the fully implicit Crank-Nicolson difference method of the heat equation, we will use the von Neumann method. The difference equation is

$$\frac{w_{pq+1} - w_{pq}}{k} = \frac{1}{2}\left\{\frac{w_{p+1q+1} + w_{p-1q+1} - 2w_{pq+1}}{{h_x}^2} + \frac{w_{p+1q} + w_{p-1q} - 2w_{pq}}{{h_x}^2}\right\} \ldots\ldots\ldots\ldots (15)$$

Approximating $\frac{\partial U}{\partial t} = \frac{\partial^2 U}{\partial x^2}$ at $(ph,(q+\frac{1}{2})k)$

Substituting $w_{pq} = \alpha^q e^{i\beta x}$ into the difference equation, we obtain

$$\alpha^{q+1}e^{i\beta ph} - \alpha^q e^{i\beta ph} =$$

$$\frac{1}{2}\left[r\left\{\alpha^{q+1}e^{i\beta(p-1)h} - 2\alpha^{q+1}e^{i\beta ph} + \alpha^{q+1}e^{i\beta(p+1)h} + \alpha^q e^{i\beta(p-1)h} - 2\alpha^q e^{i\beta ph} + \alpha^q e^{i\beta(p+1)h}\right\}\right] \; where\; r = \frac{k}{h^2}$$

Dividing by $\alpha^q e^{i\beta ph}$, we obtain $\alpha - 1 = r\alpha\left[e^{i\beta h} + e^{-i\beta h} - 2\right] + r\left[e^{i\beta h} + e^{-i\beta h} - 2\right]$

$$\Rightarrow \alpha - \alpha r[2cos\beta h - 2] = 1 + r[2cos\beta h - 2]$$

$$\Rightarrow \alpha\left[1 + 4rsin^2\beta\left(\frac{h}{2}\right)\right] = 1 - 4rsin^2\beta\left(\frac{h}{2}\right)$$

$$\Rightarrow \alpha = \frac{1-4r\left[sin^2\beta\left(\frac{h}{2}\right)\right]}{1+4r\left[sin^2\beta\left(\frac{h}{2}\right)\right]} \leq 1 \ldots\ldots\ldots (16)$$

The equation is unconditionally stable as $0 \leq \alpha \leq 1 \; for\; all\; r\; and\; \; all\; \beta$.

IX. CONCLUSION

We first introduced the one-dimensional heat equation to obtain the numerical approximation using Crank-Nicolson difference method. We have proposed the initial value problem with boundary conditions to find the numerical solution. The region is discretized into a uniform mesh. The solution is obtained by implementing Python programming by using initial and boundary conditions. The numerical solution for the heat equation is shown in Figure 4. We have investigated the local truncation error and stability analysis of the Crank-Nicolson difference method of the heat equation.

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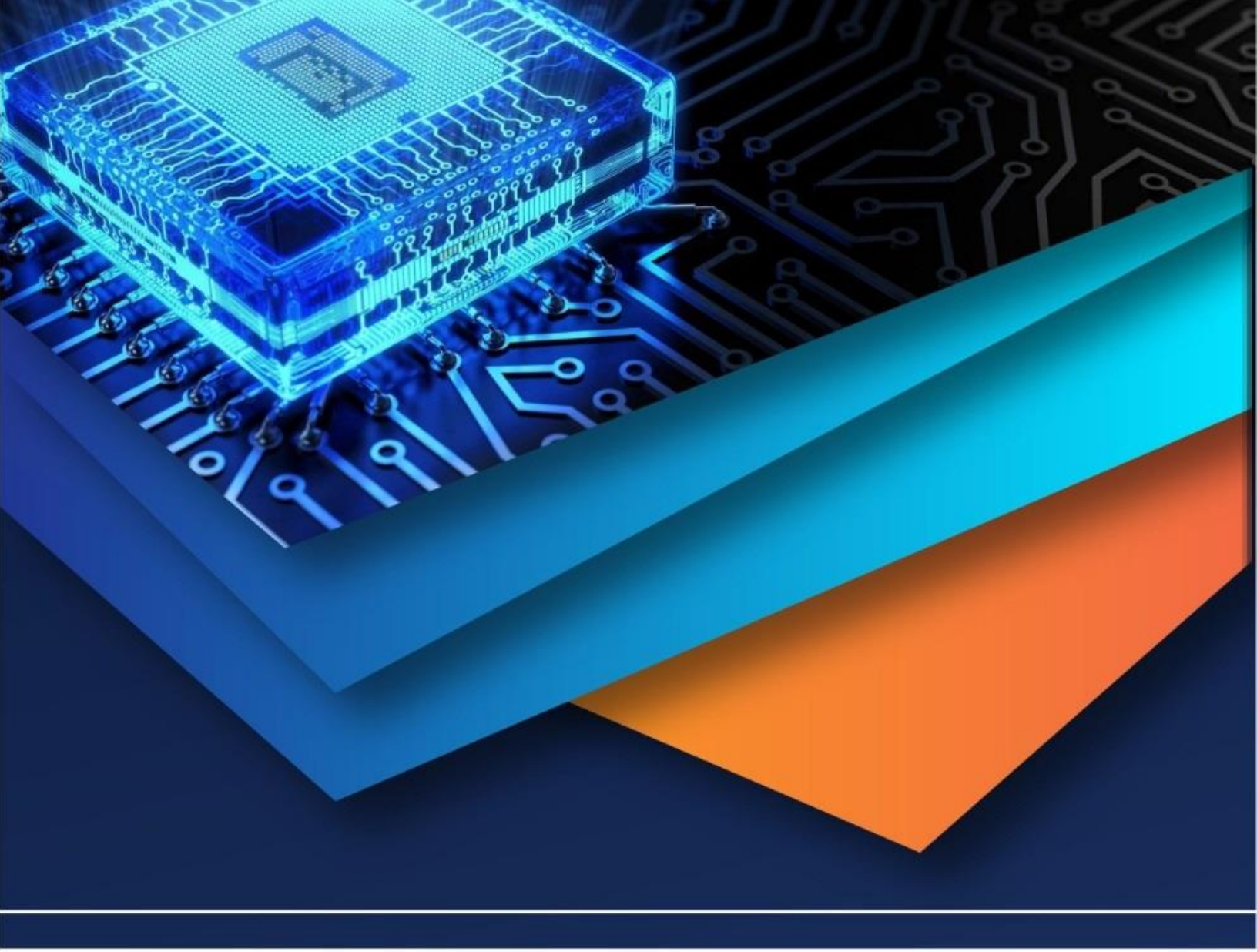

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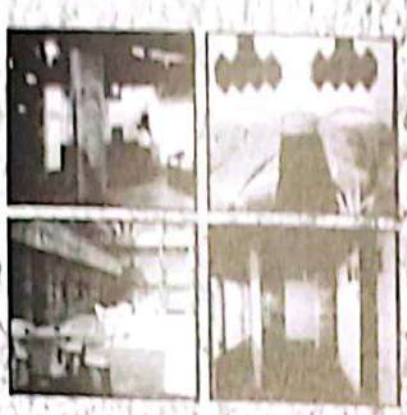

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"مجھے بذات خود اس ماحول سے کوئی شکایت نہیں، جہاں میری تراش خراش ہوئی کچرپچر بچوں کے جم غفیر میں پاپیادہ سپاہی کی طرح تربیت پائی، نہ لاڈ ہوتے نہ نخرے نہ کبھی تعویذ گنڈے بندھے، نہ نظر اتاری گئی نہ کبھی خود کو کسی کی زندگی کا اہم حصہ محسوس کیا۔۔۔"

نفسیات کی زبان میں Unwanted child کی سی زندگی! ایک حسرت کہ کاش کوئی ہمارے بھی نخرے اُٹھاتا ...ہماری بھی نظر اتاری جاتی!! محرومی سے بھرپور ایک کرب آمیز احساس... جو "شمن" کے کردار میں یوں ڈھل گیا۔

"وہ پیدا ہی بے موقعہ ہوئی... تو بچوں کے بعد ایک کا اضافہ۔ جیسے گھڑی کی سوئی ایک دم آگے بڑھ گئی اور دس بج گئے.... خدا غارت کرے اس ننھی سی بہن کو، اماں کی کوکھ کیوں نہ بند ہوجاتی... حد ہوگئی تھی بہن بھائی اور پھر بہن بھائی بس معلوم ہوتا تھا۔ بھیک منگوں نے گھر دیکھ لیا۔ اڈے چلے آتے ہیں۔ ویسے ہی کیا کم موجود تھے جو اور پے در پے آرہے تھے۔ دو ایک دن تو بھائی بہنوں نے ذرا چاؤ چونچلے کیے، پر اب بڑی آپا کا بھی جی بھر چکا تھا اور وہ بیزار تھیں۔ خیر اناموجود تھی اور وہ پل ہی تھی (ٹیڑھی لکیر۔ صفحہ ۹-۱۰)

شمن کی پیدائش کے یہ بیزار کن لمحے اس کی شخصیت کی تعمیر میں وہ پہلی اینٹ ہے جو ٹیڑھی رکھ دی گئی۔ اور اس خشت اول نے "ناثریا" ایک کج دیوار قائم کردی۔ وہ زندگی بھر جس انداز میں پلی بڑھی، حالات اور واقعات سے دوچار ہوئی۔ شخصیتوں سے متاثر و مرعوب ہوئی، بعض لوگوں سے نفرت و بیزاری کا اظہار کیا بعض عادتوں کو اپنا وطیرہ بنالیا، بعض اچھائیوں سے ہمیشہ بھاگتی رہی۔ غرضیکہ اس کی شخصیت کی یہ کجی یہ ٹیڑھا پن ہی اس ناول کا وہ اہم عنصر ہے جس کو اجاگر کرنے کی عصمت نے ایک کامیاب کوشش کی ہے۔

گھر والوں اور بہن بھائیوں کی محبت اور توجہ سے محروم یہ لڑکی ایک باغیانہ ذہن کی شخصیت میں تبدیل ہوتی چلی گئی شرارتیں، بے ہنگم حرکتیں، الجھا دینے والی عادتیں۔۔ تخریبی کاروائیاں یہ سب شمن میں اسی طرح موجود ہیں جیسی عصمت چغتائی کے کردار میں ملتی ہیں۔

انا کے چلے جانے کے بعد شمن اپنی بہن منجو کی نگرانی میں پلتی ہے منجو سے اسے بہت محبت ملتی ہے لیکن متا بھری شفقت نہیں اس لیے کہ خود ماں نہیں ہے اس کنواری بہن کی شادی کے بعد وہ بڑی آپا کی نگرانی میں چلی جاتی ہے۔ جو بیوہ ہو کر اپنی لڑکی نوری کے ساتھ میکے براجمان ہوتی ہیں۔ بڑی آپا سے اسے وہ پیار بھی نہیں ملتا جو منجو سے ملتا تھا۔ وہ اس کی شرارت پر شمن کو بری طرح پیٹ دیتی تھی اور اپنی بیٹی نوری کو اس کی صحبت سے دور رکھنے کی کوشش کرتی ہیں۔ ان کا خیال ہے کہ شمن کے ساتھ نوری بھی بگڑ جائے گی اسی لیے وہ بڑی آپا سے نفرت کرتی ہے اسے ان کی بیوگی بھی ایک ڈھونگ لگتی ہے۔

گھر والوں کی محبت سے محروم شمن جب اسکول میں داخل ہوتی ہے تو ایک مریضانہ خواہش اور بیمار حسرتوں کے ساتھ۔ کیوں کہ یہ وہ عمر ہے جب اس کے جسم میں بھی تبدیلیاں رونما ہو رہی ہیں گھر کا نفرت بھرا ماحول اور پھر یہ تبدیلیاں اسکول میں داخل ہونے کے بعد اس کی الجھنیں اور بڑھ جاتی ہیں اور گھر اور باہر کا ماحول اس میں ایک عجیب نفسیاتی کامپلیکس سا پیدا کردیتا ہے۔ وہ ضدی ہٹی، بدتمیز، شریر، خودسر اور پڑھائی سے لاپروا ہوجاتی ہے ایک ذہنی و جذباتی ناآسودگی جو اس کی جنسی جبلتوں پر اثر انداز ہونے لگتی ہے اور دھیرے دھیرے وہ گھر والوں سے متنفر ہونے لگتی ہے اس پر وہ واقعات ہونے پر سہاگہ کا کام کرتے ہیں جس سے شمن کے اندر ایک عجیب تبدیلی اور کجی آنے لگتی ہے۔ مثلاً نلاجی کا ان کی دیوار سے ناک لگائے عجیب عجیب حرکتیں کرنا، منجو کی شادی کے وقت اس کا نوری کے ساتھ تمام رسموں کو چھپ کر دیکھنا اور پھر اپنی گڑیا کی شادی میں اسے دہرانا، بڑی آپا کا گڑیا بنا کر دینا وغیرہ وغیرہ۔

یہ جذباتی و جنسی ناآسودگی اسکول کے ماحول میں جاکر اور بیدار ہوجاتی ہے جہاں Lesbian رویہ پنپ رہا تھا پھر شمن تو ایک ایسی لڑکی تھی جسے بچپن سے محبت کبھی ملی ہی نہیں تھی شاید اسی وجہ سے اپنی ٹیچر مس چرن کی ذرا سی ہمدردی پا کر وہ والہانہ طور پر ان سے محبت کرنے لگتی ہے لیکن یہ سلسلہ زیادہ دنوں تک نہیں چل سکتا اور مس چرن اسکول سے اس الزام کے تحت نکال دی جاتی ہیں کہ وہ لڑکیوں کے اخلاق خراب کررہی ہیں۔ بہرحال اسکول اور خصوصاً لڑکیوں کی بورڈنگ کی زندگی میں جو گھناؤنی حرکتیں ہوتی ہیں۔ عصمت نے ان کو بڑی چابک دستی اور نفسیاتی دانش مندی سے بے نقاب کردیا ہے خود ان کی آپ بیتی "کاغذی پیرہن" میں اس قسم کی حقیقی واقعات کا تذکرہ مثلاً رسول فاطمہ والا واقعہ نیز ایسے اور واقعات بتاتے ہیں کہ شمن کی زندگی کے بہت سے واقعات عصمت کی اپنی ذاتی زندگی کے پرتو ہیں۔

اسکول کے بعد کالج کی زندگی بھی ایک نیا احساس لے کر آتی ہے۔ شمن اسکول سے نکل کر امریکن مشنری کالج میں داخلہ لیتی ہے اور یہاں اسے احساس ہوتا ہے کہ دنیا کتنی وسیع ہے، کتنی لمبی چوڑی ہے کالج کی زندگی کی مختلف سرگرمیاں مثلاً ادبی جلسے، دل چسپ لکچر، پُرزور تقریریں، ہنگامہ خیز سیریں اور قیامت انگیز عشق بازیاں دیکھ کر عصمت کی آنکھیں کھلی کی کھلی رہ جاتی ہیں اسکول اور کالج کے اس نمایاں فرق کو عصمت اپنی آپ بیتی میں اس وقت بیان کرتی ہیں جب وہ ایف اے کے بعد علی گڑھ چھوڑ کر لکھنؤ کے آئی ٹی کالج میں مزید تعلیم کا سلسلہ جاری رکھنے کے لیے داخلہ لیتی ہیں لکھتی ہیں۔

''لکھنو میں گزارے ہوئے دو سال میری زندگی میں بہت اہم ثابت ہوئے ۔ دماغ کوئی راہیں ملیں نئے دروازے کھلے۔'' (کاغذی پیرہن۔ صفحہ (۱۶۵)

ایک اور جگہ لکھتی ہیں۔

''بی۔ اے کے بعد دنیا ہی بدل جاتی ہے چار سال میں انسان کتنا بڑا ہو جاتا ہے یونانی ڈرامے شیکسپیر سے لے کر ابسن اور برناڈ شاہ تک بہت کچھ پڑھ ڈالا (شخصیات اور واقعات جنہوں نے مجھے متاثر کیا صفحہ۔ ۲۲۰)

''ٹیڑھی لکیر'' میں شمن بھی کچھ ایسے ہی احساسات و تجربات سے دو چار ہوتی ہے عصمت نے خود تحریر کیا ہے۔

''اسکول اور کالج میں کتنا لمبا چوڑا فرق ہے۔ چند ہی دنوں میں اس نے ان گنت کتابیں پڑھ ڈالیں جن میں سے جین ایئر نے اسے حد سے زیادہ متاثر کیا۔۔۔ ٹیگور کی کہانیاں، ہارڈی کی مشہور ناول۔۔ شیلے اور کیٹس کی شاعری (ٹیڑھی لکیر صفحہ ۲۲۱،۲۰۲)

عصمت نے بی اے اور بی ٹی تک تعلیم حاصل کی اور مختلف شہروں مثلاً جاوڑا، بریلی، جودھپور اور پھر ممبئی میں ملازمت اختیار کی پہلے اسکول کی ٹیچر پھر ہیڈ مسٹریس کی حیثیت سے اور آخر میں انسپکٹر آف اسکولز کی حیثیت سے اپنے انہیں تجربات کو انہوں نے شمن کی کہانی میں شامل کر لیا ہے۔ شمن بھی تعلیم حاصل کرنے کے بعد ایک اسکول میں ہیڈ مسٹریس بن جاتی ہے اور اس طرح شمن کے سہارے انہوں نے پرائیوٹ اسکولوں میں ہونے والی بدعنوانیوں، بدانتظامیوں اور اخلاقی خرابیوں کا ڈٹ کر نقشہ کھینچا ہے ساتھ ہی ساتھ حسین تجربوں کی یادیں بھی ملتی ہیں خصوصاً جاورہ میں نواب صاحب نے لڑکیوں کو پڑھانے پر جب انہیں مامور کیا تو وہ اس دور کا منظر یوں پیش کرتی ہیں۔

''پچیس تیس لڑکیاں مختلف قد اور عمر کی جمع کر دی گئیں۔ زیادہ تر شاہی خاندان سے تعلق رکھتی تھیں اور کچھ نہیں بس انگریزی پڑھنا اور بولنا سیکھنے کا شوق تھا۔ سوچتی ہوں تو ہنسی آتی ہے۔ سبھی سنوری لڑکیاں، بڑی مہذب، بڑی پیاری، بڑے ادب سے بیٹھتیں۔ میں انہیں کچھ زبانی، کچھ بلیک بورڈ کی مدد سے انگریزی لکھنا اور بولنا سکھاتی، بڑی دلچسپ کلاس ہوا کرتی تھی کسی لڑکی کو نام سے نہیں پکارا جاتا تھا۔ بس ننھی بی، پیاری بی، گوری بی، رانی بی، بچی بی۔ سب بیبیاں تھیں۔ (کاغذی پیرہن، صفحہ ۱۸۶)

قومی اسکولوں کی زبوں حالی کو ''ٹیڑھی لکیر'' میں اس طرح بیان کیا ہے کہ وہ ''کاغذی پیرہن'' سے مستعار معلوم ہوتی ہے۔ ملاحظہ ہو۔

''قومی اسکول کا حال یہ ہے کہ اس کے منیجر ایک ناکام وکیل ہیں۔ ان کی منظور نظر رضیہ بیگم نام کی استانی ہیں، ان کا اصل کام منیجر کے لیے اچار چٹنی تیار کرنا اور ان کے تکیوں کے غلاف پر ''سویٹ ڈریم'' کاڑھنا تھا۔ چپراسیں بچوں کے کھانے میں سے کھانے چراتی تھیں یوں کہ انہیں تنخواہ بہت کم ملتی تھی۔ اسکول کا چپراسی ایک وقت منیجر کا باورچی، بیرا، فراش اور منیجر کے بچوں کی دیکھ بھال پر بھی مامور تھا بس جب اسکول انسپکٹریس کی آنے کی خبر ملی تو وہ بھورا کوٹ اور سفید صافہ باندھ کر مودب کھڑا ہو جاتا۔ اسکول کا تمام فرنیچر منیجر کے کمرے میں تھا۔

معائنے کا حال تو عصمت نے اس طرح بیان کیا ہے کہ وہ ان کا ذاتی تجربہ نظر آتا ہے منیجر کافی رقم اسکول کا لٹن کر چکا تھا۔ رجسٹر میں سامان کا اندراج ہے مگر سامان نہیں ملتا ہے۔ اسکول کی سجاوٹ کے لیے پڑوس کے گملے آ گئے ہیں کتب فروشوں کے یہاں سے کرائے پر کتابیں آ گئیں'' جس لڑکی کے ہاتھوں انسپکٹریس کے گلے میں ہار ڈلوایا، وہ اسکول کی نہیں تھی اور وہ اپنا نام بھی نہیں بتا سکی۔۔۔ نظم خوانی کے لیے وہ لڑکیوں کو پکڑ لائے لیکن نظم جو سنائی وہ کمشنر کے استقبال والی نظم تھی جس میں کسی قسم کی تبدیلی نہیں کی گئی تھی۔ غرض انسپکٹریس نے بہت کچھ ڈانٹ پھٹکار کے بعد اطمینان بخش رپورٹ لکھ دی اور چلتی بنی۔ (عصمت چغتائی بہ حیثیت ناول نگار راز ڈاکٹر فرزانہ سلیم صفحہ۔ (۱۲۷۔۱۲۶)

اسکول، کالج اور ملازمتوں کے ان تجربات کے دوران شمن چند جذباتی تجربوں سے بھی گذرتی ہے جس میں رائے صاحب سے اس کا معاشقہ اور پھر افتخار سے عشق نیز اعجاز سے عشق سے بیزاری وغیرہ شامل ہیں اس قسم کے کچھ کردار کہیں نہ کہیں ان کی اپنی اصلی زندگی میں موجود ہیں جن کو تھوڑی سی تبدیلی کے ساتھ پیش کر دیا گیا ہے۔ اس کے علاوہ ترقی پسندوں کا تذکرہ اور مختلف کرداروں کے افسانوی روپ بھی ملتے ہیں۔ مثلاً پروفیسر رحمانی، احمد علی، اور کامریڈ احمد سجاد ظہیر کا روپ معلوم ہوتے ہیں۔ اور آخر میں سفید نسل امریکن ٹیلر سے شادی، ازدواجی زندگی کی ناکامی پر یہ ناول اختتام پذیر ہوتا ہے جہاں شمن کو زندگی کی ان ناآسودگیوں، محرومیوں، تلخیوں اور ناکامیوں کے باوجود یہ احساس تسکین کا باعث ہے کہ اس کے پیٹ میں ایک بچہ پل رہا ہے وہ اس کی ماں بننے والی ہے ماں بننے کی یہ خوشی شمن کے لیے حاصل زندگی ہے۔ ملاحظہ ہوں عصمت کے یہ الفاظ۔

''آج اس بے کسی کی تنہائی میں بھی چہل پہل تھی۔ اتنی بے سروسامانی میں بھی کتنی سلجھی ہوئی سجاوٹ تھی آج وہ کتنی متحیر مگر خوش تھی دنیا کتنی حسین ہو گئی۔ زندگی کتنی عزیز'' (ٹیڑھی لکیر صفحہ ۵۸۴)

غرضیکہ ابتدا۔۔۔ اختتام تک پورے ناول کا مطالعہ اس بات کا عکاس ہے کہ عصمت نے اس ناول کے وسیلے سے اپنی زندگی کے مختلف پہلوؤں کو افسانوی انداز عطا کر کے دلکش بنا دیا ہے۔ اور کہانی کے اختتام نے تو اس میں جان ڈال دی ہے۔ گویا عصمت کے نزدیک صورتوں کے تمام دکھوں کا انت اس کی ایک خوشی میں پوشیدہ ہے۔ اور وہ ہے ماں بننا۔ ایک نامکمل، ان گھڑ عورت ماں بن کر ہی مکمل ہوتی ہے۔

یہ حقیقت ہے کہ انسان کا ماحول اس کی شخصیت کی تعمیر میں جو اہم رول ادا کرتا ہے اس کی کمی یا زیادتی کو عصمت کے اس ناول کے ذریعے بہ آسانی محسوس کیا جا سکتا ہے۔ اس ناول کا عنوان ''ٹیڑھی لکیر'' خود اس بات کا غماز ہے جس کی طرف عصمت نے اپنی آپ بیتی میں اشارہ کیا تھا۔

''ایک کج ہے میرے ذہن میں... میں آنکھ موند کر ایمان لانے کی قائل نہیں۔'' (کاغذی پیرہن۔ صفحہ۔ ۲۲۶)

شمن سے کردار کی تمام جنسی اور جذباتی کجی کے باوجود یہ حقیقت ہے کہ عصمت چغتائی نے اپنے ذاتی مشاہدے اور اپنی قوت تخیل ''ٹیڑھی لکیر'' کی شکل میں ایک نہایت اہم فن پارہ تصنیف کیا ہے اور شمن کی شکل میں اردو فکشن کو ایک لافانی کردار دیا ہے۔ ''ٹیڑھی لکیر'' سے اردو میں پہلی بار نفسیاتی ناول نگاری کی ابتداء ہوئی اور یہی عصمت کی اردو ناول کو اصل دین ہے کہ انہوں نے ناول کو زیادہ بے باکی اور جرأت اظہار عطا کی۔ (برصغیر میں اردو ناول صفحہ ۳۷)

اقبال نیازی کے بعض افسانچوں میں ایک اور وصف ملتا ہے جو ان کی شناخت ہے۔ یہ رنگ بھی آپ کو اردو افسانچوں خال خال ہی نظر آئے گا۔ ان افسانوں کا مرکزی اشعار کی بھرپور ترجمانی کرتا ہے۔

پروفیسر اسلم جمشید پوری

چیونٹیوں کے درمیاں

افسانچے و مختصر کہانیاں

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قرۃ العین حیدر کے رپورتاژ (۱۹۵۹ء تا ۱۹۸۳ء)

ڈاکٹر شاداب سید
اسسٹنٹ پروفیسر، رضوی کالج آف آرٹس، سائنس اینڈ کامرس، ممبئی

اردو میں رپورتاژ نگاری صرف رپورٹ نہیں بلکہ ایک ادبی صنف کی حیثیت سے اس کا اپنا ایک مقام ہے جو خود بخود غیر ارادی طور پر اُبھر کر سامنے آیا۔ اور ترقی پسندوں نے اسے اپنا مقاصد کی تشہیر و تشریح کے لئے استعمال کیا اور ہر کانفرنس کے بعد انہوں نے ایک رپورتاژ لکھا۔ یوں اردو میں رپورتاژ کا ادبی ذخیرہ وجود میں آیا۔ جہاں تک ترقی پسند خواتین قلم کاروں کا سوال ہے، انہوں نے اس تحریک میں ہر اعتبار سے مردوں کے شانہ بہ شانہ بڑھ چڑھ کر حصّہ لیا۔ اسی لیے رپورتاژ کی بھی کمی نہیں جو خواتین کے قلم کی دین ہیں۔ یہاں اس حقیقت کی وضاحت لازمی ہے کہ ''رپورتاژ'' کا حقیقت پر مبنی ہونا، کہانی کا عنصر اور حقیقی واقعات کا حقیقی کرداروں کے ذریعے پیش کیا جانا'' لازمی ہے نیز یہ کہ رپورتاژ میں رپورتاژ نگار کی شخصیت کا براہِ راست اظہار دیگر اصنافِ نثر کی بہ نسبت زیادہ ہوتا ہے اسی لیے وہ خودنوشت کی ایک صورت قرار دی جاسکتی ہے۔

طلعتِ گل اس صنف پر بھرپور روشنی ڈالتے ہوئے رقم طراز ہیں۔

> ''رپورتاژ میں رپورتاژ نگار اپنی شخصیت اور واقعے کے درمیان دل کش اور غیر محسوس رشتہ جوڑ کر واقعے کو اس طرح بیان کرتا ہے کہ اس کی وحدت، موضوع اور مقصدیت مل کر وجہ تصنیف کو واضح اور نمایاں کر دیتی ہیں اور جزئیات نگاری کی حیثیت ثانوی اور ضمنی ہو جاتی ہے رپورتاژ نے نہ صرف یہ کہ داخلی، خارجی احساسات، ماحول کے حقیقی، صداقت آمیز اظہار کا وسیلہ مہیّا کیا ہے بلکہ سماجی حقائق کا پس منظر پیش کرنے میں بھی خاطر خواہ کامیابی حاصل کی ہے۔ سماجی بصیرت اور سیاسی شعور کی ہمہ گیری نے رپورتاژ کو زندگی کے ''عملی پہلو'' سے قریب کر دیا ہے'' (۱۲۳)

اس اعتبار سے خواتین کے جو رپورتاژ ہمارے ادب میں ملتے ہیں وہ زیادہ تر ترقی پسند قلم کاروں کے ہیں جن میں عصمت چغتائی، قرۃ العین حیدر، رضیہ سجاد ظہیر، خدیجہ مستور، صفیہ اختر اور زہرہ جمال کے نام خاص طور پر قابلِ ذکر ہیں۔

ادب کے بدلتے ہوئے موضوعات میں سے ایک موضوع 'جنگ' بھی رہا ہے، جس کے تباہ کُن اثرات نے سارے عالم کے امن کو درہم برہم کر کے رکھ دیا تھا۔ دنیا بھر کے ادیبوں نے اس موضوع کو لے کر اعلیٰ ادب تخلیق کیا۔ امن کی کوششیں کی جانے لگیں۔ اسی سلسلے میں جاپان میں ساری دنیا کے ادیبوں کی بین الاقوامی کانگریس کا انتیسواں سالانہ جلسہ منعقد ہوا۔ قرۃ العین حیدر نے بھی اس کانگریس میں شرکت کی اور وہاں کی کاروائیوں اور واقعات کی روداد ایک

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رپورتاژ بعنوان ''ستمبر کا چاند'' کی صورت میں تحریر کی جو ۱۹۵۹ء میں پہلے ''نقوش'' میں اور پھر کتابی شکل میں ۱۹۷۷ء میں لاہور سے شائع ہوا۔

ستمبر کا چاند: اس رپورتاژ میں قرۃ العین حیدر نے جنگِ عظیم اور اس سے پیدا شدہ ہولناک نتائج کو بڑے ہی موثر انداز میں پیش کیا ہے۔ انہوں نے اپنے مخصوص زورِ بیان اور دل کش اسلوب کا سہارا لے کر عالمِ انسانیت کو یہ باور کرانے کی کوشش کی ہے کہ جنگ خود ایک مسئلہ ہے، وہ مسئلوں کا حل نہیں دے سکتی۔ نیز یہ کہ یہ انسانی زندگی کو کس طرح تباہ و برباد کر دیتی ہے اور اس کے اثرات صدیوں تک بنی نوع آدم کو بھگتنا پڑتے ہیں۔

قرۃ العین حیدر نے اس کانگریس میں شریک ادیبوں کی شخصیت پر اور ان کے نظریات و احساسات پر افسانوی انداز میں پیش کیا ہے۔ اُن کی ناولوں کی طرح کرداروں کی زیادتی کے باوجود ہر کردار اپنی جگہ جاذبِ نظر اور قابلِ توجہ نظر آتا ہے اور قاری کو اکتاہٹ محسوس نہیں ہوتی۔ یہ سارے کردار انسان دوست اور امن پسند ہی نہیں بلکہ امن و انسانیت کا پیغام عام کرنے کے لیے یہاں جمع ہوئے ہیں۔ اس لیے محترم بھی اور قابلِ قدر بھی۔ یہ سب کردار کانگریس میں چلتے پھرتے، بولتے اور گفتگو کرتے دکھائی دیتے ہیں اس کانگریس کی پہلے دو تین روز کی کارگذاریوں کا تذکرہ کرتے کرتے قرۃ العین حیدر کا تاریخی شعور انگڑائیاں لے کر بیدار ہو جاتا ہے اور جاپان کی تہذیبی و ثقافتی تاریخ میں گم ہو جاتی ہیں پھر قرۃ العین ہیں، جاپان ہے اور تاریخ ہے!!

گُل گشت: قرۃ العین کا دوسرا رپورتاژ ہے۔ یہ جون ۱۹۷۴ء میں ماسکو یونیورسٹی کے ذکر سے شروع ہوتا ہے اور جموں میں مہاراجہ ہری سنگھ کے محل پر ختم ہوتا ہے یہ رپورتاژ دو حصّوں میں تقسیم کیا گیا ہے۔ ایک روس دوسرا کشمیر۔ روس کی روداد ۱۶ ذیلی عنوانات محیط ہے اور کشمیر کا بیان ۹ ذیلی عنوانوں میں ملتا ہے۔ روس سے کشمیر تک کا یہ سفر دراصل پھر قرۃ العین نے تاریخی شعور کے ہمراہ کیا ہے۔ ہر جگہ تاریخ کوئی نہ کوئی نئی کہانی سناتی ہے صدیوں سے چلی آنے والی کہانی جو زماں کے تسلسل کو مکاں کو جوڑتی ہے اور مکاں سے زماں تک پھیلی ہوئی ہے۔

کوہ دماوند: قرۃ العین حیدر کا وہ رپورتاژ ہے جو ۱۹۷۹ء میں شائع ہوا۔ یہ رپورتاژ بھی ''گل گشت'' کی طرح دو حصوں میں منقسم ہے۔ حصّہ اوّل تہران، اصفہان، ارضی، شہر جلفا وغیرہ کے سفر پر مبنی ہے۔ حصہ دوم میں ایران کی ملکہ فرح دیبا کی زندگی کی وہ کہانی بیان کی گئی ہے جو مصنفہ کو خود شاہ بانوئے ایران نے کوہ دماوند میں ۱۹۷۰ء میں سنائی تھی کہ کس طرح شہنشاہِ ایران آریہ مہر علی رضا اپنے ولی عہد سے محرومی کے سبب اپنی دو بیویوں کو طلاق دینے پر مجبور ہوئے اور پھر اتفاق سے ایک کم عمر عام سی ایرانی لڑکی فرح دیبا ان کے دل کو چھو گئی اور آسمانِ قسمت پر ایک چمکتا ستارہ بن کر چھا گئی۔ یہ پوری روداد کہیں انٹرویو کی شکل میں ہے اور کہیں گفتگو کی جو مصنفہ اور ملکہ ایران کے مابین جاری ہے۔ ساتھ ہی ساتھ قرۃ العین حسب معمول ایران کی تاریخ پر بھی روشنی ڈالتی چلی جاتی ہیں۔ وہاں کی معاشی، معاشرتی، تہذیبی، ثقافتی زندگی، طور طریقے، لباس، رقص و سرود، شاہی دربار اور اس کے آداب وغیرہ وغیرہ کی بھرپور تفصیل بڑے فن کارانہ انداز میں پیش کی گئی ہے۔ ایران کا دل کش محل وقوع، اور اس سرزمین کا فطرتی حُسن ـــــ جو ''کاخِ سعد'' کے بیان میں یوں مصور

ہوگیا ہے۔

''یوروپین وضع کا عظیم الشان محل کئی ایکڑ پر پھیلے، اس کے پارک میں بلند و بالا درختوں پر صبح کی دھوپ، بارش کی لطیف پھواروں کی طرح برس رہی تھی، سارے میں بڑی مودب خاموشی طاری تھی۔ برآمدے میں چند السیشن کتے محوِ خواب، اندر وسیع مرمریں ہال میں چند درباری افسر اس طرح ٹیل کوٹ پہنے مجسموں کی طرح ایستادہ'' (کوہِ دماوند ــــ صفحہ۔ ۵۶۔ ۵۷)

یہ رپورتاژ قرۃ العین نے تہران سے بمبئی آکر فوراً لکھنا شروع کر دیا تھا مگر اس کے مکمل ہونے میں تقریباً ڈیڑھ ماہ کا عرصہ لگ گیا اور اسی لیے اس کی اشاعت میں بھی تاخیر ہوگئی جب کہ کسی بھی رپورتاژ کے لیے ضرور ہے کہ وہ کسی واقعے یا حادثے کے فوراً بعد تحریر کر دیا جائے۔

دکن سا نہیں ٹھار سنسار میں: قرۃ العین حیدر کا سب سے عمدہ رپورتاژ ہے جس کا عنوان غالباً مُلّا وجہی کے مصرعے سے اخذ کیا گیا ہے۔ رپورتاژ حیدر آباد دکن کی علمی، ادبی، سیاسی، معاشی، معاشرتی اور ثقافتی تاریخ کی داستان سناتا ہے۔ کہیں ماضی کی یادیں ہیں تو کہیں حال کی سرگرمیاں اور کبھی مستقبل کی امیدیں۔ وقت کے تسلسل سے جُڑا ہوا یہ رپورتاژ مصنفہ کے اندون میں برپا اس مدوجزر کا غماز ہے جس نے تاریخ کو اور بھی خاص طور پر مسلمانوں کی تاریخ کو ایک وجہ عبرت بنا دیا ہے۔ اس کا احساس شدت سے اس وقت ہونے لگتا ہے جب ٹرین کی کوچ میں ایک ایسی بھکارن چڑھتی ہے جس کی گود میں ایک بچہ ہے اور وہ پہلے کنڑ میں، پھر دکنی، اردو میں اور پھر انگریزی میں بھیک مانگتی ہے، قاری کو اس نازک اشاروں کو سمجھنے میں دیر نہیں لگتی کہ اس ایک منظر سے مصنفہ کون سی بات اس تک پہنچانا چاہتی ہے۔ طلعت گل نے اس کو اس طرح وضاحت سے پیش کیا ہے ــــ

''دولت کی ریل پیل، سر سالار جنگ کا ترکہ، رؤسا حیدر آباد، بڑے بڑے جاگیر دار لیکن تعلیم سے محروم، غرضیکہ طنز، بے بسی کا احساس اور درد و کرب ان کی (قرۃ) تحریر سے نمایاں ہے۔ دکن کا معاشی

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لحاظ سے آگے بڑھنا اور اہلِ علم حضرات کا اس زمین پر آنا اور سازگار ادبی ماحول کا بننا، دکن میں رفتہ رفتہ نئی تہذیب کا ابھرنا اور پرانی اقدار کا تاریخ کے صفحات میں جگہ لینا، ان تمام کڑیوں کی وضاحت کے ساتھ مصنفہ زمانہ حال میں لوٹ آتی ہیں جہاں بنجارہ ہل پر اختر سلطانہ کے ٹیرس سے شہر کا نظارہ ہالی ووڈ جیسا معلوم ہوتا ہے۔ انجمن ترقی اردو ادارہ ادبیات اردو آندھرا پردیش اردو اکاڈمی، اردو، اکاڈمی آف ساؤتھ وغیرہ کے جلسے اردو ہال انجمن ترقی اردو کا کل ہند اجلاس کتابوں کی نمائش اور ادیبوں اور شعراء کا اجتماع اور حیدرآباد کیا تمام جنوبی ہند میں لوگوں کا حمِ غفیر اور ماضی کی حسین یادیں، ان سب کا حسین مرقع اس رپورتاژ کی شکل میں قرۃ العین حیدر نے پیش کیا ہے'' (۱۲۶)

لندن لیٹر: قرۃ العین حیدر کا وہ رپورتاژ ہے جس میں انہوں نے رپورتاژ نگاری کے فن اور اصول وضوابط پر بحث کرتے ہوئے اس صنف کی تعریف وضع کرنے کی کوشش کی ہے۔ قرۃ العین حیدر کب لندن گئیں اس کا پتہ اس اس رپورتاژ سے نہیں چلتا۔ البتہ یہ رپورتاژ ایک آنکھوں دیکھا حال کی سی کیفیت لیے ہوئے ہے جس میں مصنفہ کی اپنی ذات شامل ہوگئی ہے۔ قرۃ العین حیدر کے دیگر تمام رپورتاژ کی طرح اس میں بھی سفر کی حالت دکھائی دیتی ہے گویا یہ رپورتاژ بھی ایک قسم کا سفرنامے۔ ویسے بھی سفرنامہ اور رپورتاژ ایک دوسرے کے بہت قریب ہوتے ہیں اس لیے بعض لوگ سفرنامے اور رپورتاژ میں فرق نہیں کر پاتے ہیں۔ دراصل ہر وہ واقعہ، حادثہ، لمحہ یا پل رپورتاژ میں فضا اور کیفیت کو برقرار رکھ سکے رپورتاژ کے فن اور اصول سے مطابقت رکھتا ہے اگر رپورتاژ نگار سفر کی فضا اور ماحول کو ان خوش گوار اور ناخوش گوار واقعات اور تجربات کے ساتھ قاری تک پہنچانا چاہتا ہے تو اس میں کوئی مضائقہ نہیں۔ 'لندن لیٹر' بھی ایسا ہی رپورتاژ ہے۔ بقول طلعتِ گل ــــ

''قرۃ العین حیدر نے اس رپورتاژ میں گپ شپ کا انداز اپنایا ہے ــــ رپورتاژ کی ابتدا میں وہ ایک ہلکے پھلکے آزادی کے احساس کے ساتھ سفر کی کیفیت کو رقم کرتی ہیں آزادیِ ہند نے نوجوانِ نسل کو ایک نئی زندگی دی وہ فخر سے سر اُٹھا کر چلنے کا حوصلہ خود میں پانے لگے، لیکن غیر ملکی لوگ اب بھی ہندوستان کی تحریکِ خلافت کو سننے میں کسی دلچسپی کا اظہار نہیں کرتے، بیروت، خلیل جبران، قرۃ العین حیدر کے بابا سجاد حیدر یلدرم کا ترکی، لندن میں مسلمانوں اور مسجدوں کی تعداد، اُن کی معاشی حالت، انگریزوں کی نفسیات، ہالی ووڈ کا اسی فی صد چونی والے سیٹ کا طبقہ (فلموں کی حد تک) تحریر وتقریر کی آزادی، افلاس وگندگی، غریبی، بے روزگاری، بھوکے پیٹ سونے کا خوف، بے گھر ہونے کا احساس، بڑھاپے کی محرومی، ضعیفوں کی قابلِ رحم تنہائی، بڑے بڑے لارڈ اور کاؤنٹس کا زوال پذیر ہونا وغیرہ پر لکھتے لکھتے

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اچانک کلچرل ہارمنی کا ذکر، کلچرل ہارمنی سے فوراً سیاست، اشتراکیت، امریکی طرز جمہوریت مسلہ اسرائیل وفلسطین، کالے گورے کا تضاد اور پھر ایک ہی پل میں ادب اور ادبی رجحانات پر گفتگو۔ الغرض یہ ہلکی پھلکی تحریر اپنے آپ میں معلومات کا بیش بہا خزانہ اور دلچسپی کا خزانہ لیے ہوئے ہیں۔ جہاں ماحول ہے۔ مناظر کے پس منظر میں اُبھرتے ہوئے چہرے ہیں اور ان چہروں میں نمایاں اور واضح خود رپورتاژ نگار کا چہرہ بھی ہے۔''

یہ اقتباس ذرا طویل ہو گیا ہے، لیکن اس سے قرۃ العین حیدر کی رپورتاژ نگاری کو سمجھنے میں مدد ملتی ہے۔ ایک نئے اور منفرد انداز میں وہ ایک قوم کی تہذیبی، سیاسی اور سماجی زندگی کی تصویریں اور دنیا بھر کی شخصیتوں سے قاری کو روشناس کراتی ہیں۔ اس میں شکل نہیں کہ قرۃ العین جس طرح اپنے ناول اور افسانوں میں ایک منفرد مقام کی حامل ہیں۔ اسی طرح رپورتاژ نگاری میں بھی ایک انفرادی طرز کی مالک۔ اور یہ بات خواتین قلم کاروں کے لیے بڑی خوش کن ہے۔

☆☆☆

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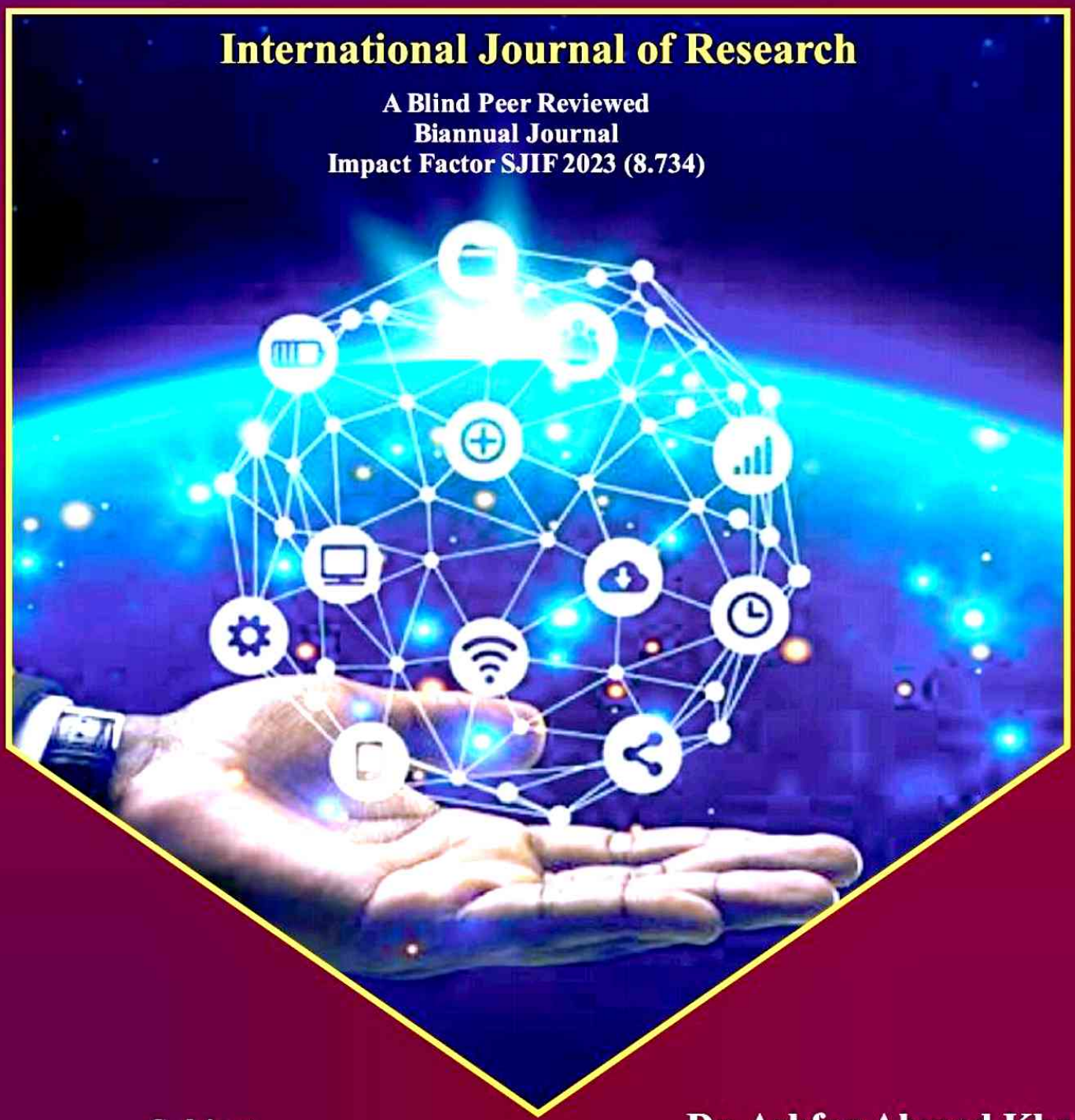

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गोडसे@गांधी.कॉम नाटक में गांधी और उनके विचारों की प्रासंगिकता

Relevance of Gandhi and His Ideas Through an Unconventional Drama- "Godse@Gandhi.Com"

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Abstract

The modern era saw Senior fiction writer and playwright Asghar Wajahat's literary prowess amidst great writers like Hrishikesh Sulabh, Habib Tanveer, Narendra Mohan, Sushil Kumar Singh, Vibha Rani, Shashi Kiran, Usha Ganguly, Swadesh Deepak, Prabhakar Kshotriya, Jayant Pawar, Nadira Zaheer Babbar etc. His amazing style and ability to compose stories, dramas, and novels made him popular amongst his contemporaries while raising the bar. Asghar Wajahat has been successful in creating a special identity in the Hindi literary world due to his sharp writing which is why he is not dependent on any introduction today. The literature of Asgar Wajahat serves a mature and strong vision of life with his unique attitude, and artistic creation-skill, has been bringing our today's time, society, and present reality in front of aware readers. Asghar Wajahat has followed the inner works of life in a theatrical form. His literature is the literature of a changing society. The language of a changing society is made from a collage of its modernity, desire, sensibility and experiences. Asghar Wajahat uses reality and fantasy in his literature, as well as blending history and personal experiences to create an atmosphere. Senior fiction writer and playwright Asghar Wajahat's recently published new play 'godse@gandhi.com' opens up the possibility of a fresh debate and dialogue on the relevance of Gandhi and Gandhism in our today's socio-political scenario. After tackling the smoldering question of communalism on a creative level in his famous play 'Jis Lahore Nayein Dekhya Wo Janmai Hi Nahi', Asghar Wajahat in his new play explores the possibilities and limitations of Gandhian paths and values according to today's time.

Keywords: *Asghar Wajahat, godse@gandhi.com, Mahatma Gandhi, fiction writer, Hindi drama*

आज जो भी नाटक लिखे जा चुके हैं वे हमारे सामाजिक, राजनीतिक, आर्थिक,धार्मिक और सांस्कृतिक जीवन के यथार्थ को प्रस्तुत करते हैं।नाटक ही एक ऐसा माध्यम है जिसके द्वारा नाटककार समाज को एक संदेश देता है।साहित्य में नाटक का स्थान सर्वोच्च शिखर पर है,वास्तव में नाटक ही वह विधा है, जिसके द्वारा हम अपने समाज के सत्य के स्वरूप का दर्शन करते हैं। अतः नाटक में जिस युग का चित्रण है उस युग के वातारण और परिवेश का निर्माण करने के लिए नाटककार दृश्य बंध का प्रयोग करते हैं। गोविंद चातक के मतानुसार- "किसी भी प्रस्तुति की दृश्य सज्जा नाट्य कृति के अनुरूप होने के वाद्य है।"१नाटककार विभिन्न उद्देश्यों व संदेशों को नाटक के माध्यम से जनता के समक्ष प्रस्तुत करता है।इस संदर्भ में वीरेंद्र मेहंदी रत्ता के अनुसार- "किसी भी नाटक कावस्तु-विन्यास, अंक विभाजन तथा दृश्य योजना अथवा दृश्य बंध की संकल्पना पर निर्भर करता है। " २नाटकों के माध्यम से तत्कालीन भारतीय समाज, राजनीति,धार्मिक,आर्थिक परिस्थितियों का यथार्थ धरातल पर चित्रण हुआ है।समाज के प्रत्येक क्षेत्र की समस्याओं का चित्रण नाटककार ने अपने पात्रों के माध्यम से किया है।नाटककारों ने पति-पत्नी, सास- बहु, बहन- भाईसंबंधों की संवादहीनता, स्वच्छंद दयौनाचार आदि सभी तथ्यों पर लेखनी चलाई है।21वीं शताब्दी के

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नाटककारों ने कोई भी ऐसा पक्ष अछूता नहीं रहने दिया। उन्होंने अपनी नैतिक रचनाओं के सभी विषयों पर नाटक प्रस्तुत किया है।

नाटक देखते समय दर्शक अपने व्यक्तिगत रूप में ही नहीं, मुख्यतः अपने सामाजिक रूपसे प्रभावित होता है। दर्शक-वर्ग अलग-अलग व्यक्तियों का जोड़ नहीं वह एक प्रकार की नई सामाजिक इकाई है, जिसमें हमारा आदिम, सामूहिक, समष्टिमूलक व्यक्तित्व उभरकर जागृत होता है। इसलिए नाटक देखते समय हम दूसरों के साथ हँसते हैं, रोते हैं, उत्तेजित होते हैं, आस्थिर होते हैं। हम भी उस नाटक में कहीं खो जाते हैं। रंगशाला के भीतर व्यक्ति का व्यवहार बहुत बार उसके निजी एकांत जीवन से एकदम भिन्न हो जाता है, जैसे वह कोई और ही व्यक्ति हो। ऐसे दर्शक वर्ग तक एक निश्चित समय की सीमा में अपनी अनुभूति के संप्रेषण के लिए यह आवश्यक है कि नाटककार अपने अनुभूति के व्यक्तिगत विशिष्टता को उस सामान्य समष्टिमूलक वस्तु-रूप में प्रतिष्ठित करें जिसके बिना उसका संप्रेषण संभव नहीं। इस संदर्भ में नेमिचंद्र जैन लिखते हैं- "नाटककार के लिए व्यक्तित्व की उपलब्धि जिस प्रकार आवश्यक है, उसी प्रकार व्यक्तित्व से मुक्ति भी, इसी कारण नाटककार का लक्ष्य समुदाय के सर्वोन्नत, सर्वोत्कृष्ट व्यक्ति के बजाय उस काल्पनिक व्यक्तिका अनुरंजक है जो एक साथ ही दर्शक वर्ग के सबसे कम और सबसे आधिक शिक्षित, विकसित और परिष्कृत व्यक्तित्व का प्रतीक हो। " ३ जिस समाज में हम रहतेहैं। उसके वास्तविक स्वरूप के प्रति अनभिज्ञ हैं। नाटक व हसशक्त माध्यम है,जो हमें जीवन की सच्चाई से अवगत करता है। जहाँ हमारी सोच नहीं पहुंच पाती वहाँ पहुंच जाते हैं।नाटकों के माध्यम से यह लगता है कि यह हमारे जीवन की वास्तविकताओं को उभारता है। जैसे यह हमारी अपनी कहानी हैऔर हमारी आत्मा को गहराई से छूते हो।धर्म-अधर्म,आस्था-अनास्था, आत्मनिर्वासन, असुरक्षा,मृत्युबोध,क्षणबोध,दहकन की द्वन्द्वात्मक स्थितियों के बीच आज की नाट्य चेतना स्फीत हुई है।ये स्वर कहीं परिवर्तन के पोषक हैं, कहीं विघटन के समर्थक तो कहीं विद्रोहात्मक।

आधुनिक युग में हृषीकेश सुलभ, हबीबतनवीर, नरेन्द्रमोहन, सुशीलकुमारसिंह, वीभारानी, शशिकिरण, उषागांगुली, स्वदेशदीपक, प्रभाकर क्षोत्रीय, जयंत पवार, नादिरा जहीर बब्बर,सरीखे रचनाकारों के सामने असगर वज़ाहत का साहित्यिक फलक का दायरा बड़ा हैक्योंकि उनकी कहानी,नाटक एवं उपन्यास रचने की अद्भुत शैली व क्षमता ने इन्हें समकालीन लेखकों से ऊपर उठाया है और लोकप्रिय बनाया है। धुआँधार और धार-धार लेखनी के कारण असगर वजाहत हिंदीसाहित्य जगत में अपनी विशेष पहचान बनाने में सफल हुए हैं। इसलिए कहा जाता है कि असगर वज़ाहत आज किसी पहचान (परिचय) के मोहताज नहीं हैं। अपने अनूठे तेवर, एक कलात्मक रचना-कौशल के साथ एक परिपक्व और सशक्त जीवन दृष्टि को सामने रखकर साहित्य रचनेवाले असगर वजाहत का साहित्य हमारे आज के समय, समाज और वर्तमान यथार्थ को जागरूक पाठकों के समक्ष लाता रहा है। असगर वजाहत ने जीवन की अन्तःकृतियों को नाट्य रूप में प्रवाहित किया है। उनका साहित्य बदलते हुए समाज का साहित्य है। बदलते हुए समाज की भाषा अपनी आधुनिकता, बांकपन, संवेदनशीलता और अनुभवों के कोलाज सेनिर्मित होती है। असगर वज़ाहत ने अपने साहित्य में वास्तविकता और फन्तासी के प्रयोग के साथ-साथ वातावरण बनाने के लिए इतिहास और निजी अनुभवों का भी सम्मिश्रण किया है।

गांधीवादी दर्शन हमें एक सामाजिक प्राणी के रूप में सोचने को मजबूर करता है। जहां मनुष्य अपने आवश्यकता के अनुरूप ही भौतिक वस्तुओं का उपयोग करता है। वह व्यक्ति से बढ़कर समाज को मानता है। महात्मा गांधी के जीवन के विभिन्न पहलुओं पर आजतक देश-विदेश में कई किताबें लिखी गई है जिसमें ज्यादातर किताबें गांधी के जीवन, दर्शन और गांधी के नेतृत्व में हुए राजनीतिक आंदोलनों के इर्द-गिर्द ही लिखी जाती रही हैं। यानी ये किताबें या तो गांधी की जीवनियां हैं या गांधी से होकर निःसृत होने वाला इतिहास। एक बेहद विचित्र स्थिति यह है कि गांधी पर शोधपरक किताबों की बाढ़ के बीच सृजनात्मक साहित्य या लोकप्रिय कला माध्यमों से गांधी लगभग गायब हैं। पिछले-दिनों बनी इक्की-दुक्की फ़िल्मों को छोड़ दें तो गांधी का जीवन और मूल्यों के कलात्मक पुनर्निर्माण की कोशिश बहुत कम दिखाई देती है। भारतीय कला तथा साहित्य के समस्त क्षेत्र में गांधीवादी दर्शन का प्रयोग किया है। नाट्य साहित्य भी इससे अछूता

नहीं रहा है। अनेक भारतीय नाटककारों ने गांधी जीवन तथा दर्शन को आपने नाटक का आधार बनाया है। हिंदी के नाटककारों ने भिन्न-भिन्न परिस्थितियों को उठाकर गांधीवादी दर्शन की आज के समय में प्रासंगिकता की तलाश की है। आज के समय में गांधीवादी मूल्यों की क्षति को हिंदी नाटकों में बखूबी दिखाया जा रहा है। सर्वेश्वर जैसे नाटककार ने राजनीति के क्षेत्र में हो रहे गांधी के नामसे लूट को अपने 'बकरी' नाटक में रखा है तो असगर वजाहत ने फेंटसी के माध्यम से एक अद्‌भुत संवाद का क्षेत्र खोला है जहां अपने हत्यारे को क्षमा कर उन कारणों को तलाश करने की बात हुई है जिससे लोग हत्या जैसे कुकर्म पर उतारू हो जाते हैं। यह नाटक गांधी के विचारों में युगानुरूप परिवर्तन की भी मांग करता है। गिरिराज किशोर अपने नाटक में उन प्रश्नों के जवाब तलाशते हैं जिनसे कोई व्यक्ति कर्मों, सोच और उद्देश्य में महात्मा बनता है। जिसमें गांधी की महानता और दुर्बलता को भी दिखाया गया है। पहली बार 'भारत की राजनीति में कोई ऐसा व्यक्ति हुआ जो अपने बल पर जनबल को एक कर सका। इन कारणों के कारण ही नाटककारों ने गांधीवादी दर्शन और गांधी चरित्र को अपने नाटकों का नायक बनाया है।

महात्मा गांधी के जीवन के विभिन्न पहलुओं पर आजतक देश-विदेश में कई किताबें लिखी गई है जिसमें ज्यादातर किताबें गांधी के जीवन, दर्शन और गांधी के नेतृत्व में हुए राजनीतिक आंदोलनों के इर्द-गिर्द ही लिखी जाती रही हैं। यानी ये किताबें या तो गांधी की जीवनियां हैं या गांधी से होकर निःसृत होने वाला इतिहास। एक बेहद विचित्र स्थिति यह है कि गांधी पर शोधपरक किताबों की बाढ़ के बीच सृजनात्मक साहित्य या लोकप्रिय कला माध्यमों से गांधी लगभग गायब हैं। पिछले-दिनों बनी इक्की-दुक्की फ़िल्मों को छोड़ दें तो गांधी का जीवन और मूल्यों के कलात्मक पुनर्निर्माण की कोशिश बहुत कम दिखाई देती है। गांधी को लेकर इस तरह की विस्मृति की मुद्रा आज के सृजनात्मक परिदृश्य की एक सच्चाई है।

वरिष्ठ कथा लेखक और नाटककार असगर वजाहत का हाल ही में प्रकाशित नया नाटक 'गोडसे@गांधी.कॉम' हमारे आज के सामाजिक-राजनीतिक परिदृश्य में गांधी और गांधीवाद की प्रासंगिकता पर नये सिरे से जिरह और संवाद की संभावना के द्वार खोलता है। अपने चर्चित नाटक 'जिस लाहौर नई देख्या वो जन्माई ही नहीं' में सांप्रदायिकता के मुलगते सवाल से रचनात्मक स्तर पर जूझने के बाद अपने इस नये नाटक में असगर वजाहत आज के समय के हिसाब से गांधीवादी रास्तों और मूल्यों की संभावनाओं और सीमाओं की पड़ताल करते हैं। 'आज अगरगांधी जिंदा होते तो क्या करते?' का जवाब खोजने की कोशिश में वजाहत जी ने एक एक दिलचस्प नाटकीय प्रविधि का इस्तेमाल किया है। यह प्रविधि है मंच पर गांधी को पुनर्जीवित करना। नाटक की शुरुआत रेडियो की इस उद्घोषणा से होती है- "समाचार मिला है कि ऑपरेशन के बाद महात्मा गांधी की हालत में तेजी से सुधार हो रहा है। उन पर गोली चलाने वाले नाथूराम गोडसे को अदालत ने 15 दिन की पुलिस हिरासत में भेज दिया है।"[४] महात्मा गांधी जी गोडसे को माफ़ कर देते हैं और उससे मिलने की इच्छा जताते हैं। सत्याग्रह के सहारे संवाद को सबसे बड़ी ताकत मानने वाले गांधी और गोडसे का संवाद इतिहास में 'भले संभव नहीं हो पाया, लेकिन यह सवाल तो इतिहास छोड़ ही गया है कि अगर गांधी गोडसे की गोली से बच गये होते तो क्या होता? दो किस्तों में होने वाले गांधी-गोडसे संवाद को दो विचारधाराओं के बीच की टकराहट को बौद्धिक स्तर पर समझने की कोशिश कहा जा सकता है। गांधी जी गोडसे से कहते हैं- "मैं घृणा और प्रेम के बीच से नया रास्ता, संवाद का रास्ता, डायलॉग का रास्ता निकालना चाहता हूं।"[५] महात्मा गांधी सवाल करते हैं-"क्या तुमने हिंदुस्थान को देखा है?यानी उस देश को जो सिंधु से लेकर असम तक और कश्मीर से लेकर कन्याकुमारी तक फ़ैला हुआ है। इस देश में रहने वाले उन तमाम लोगों को उनके जीवन को, उनके काम को, जिनसे यह देश बनता है। इसे सिर्फ़ हिंदुओं का देश मानना इसके बहुरंगी जीवन को, इसके अभूतपूर्व सांस्कृतिक इतिहास को न्यून करना है। उसकी आत्मा में समाहित समन्वय की अदम्य चेतना को नकारना है।"[६] जाहिर है यह बात तब न गोडसे ने समझी थी और न आज की वे चरमपंथी शक्तियां समझती हैं, जो बहुलतावाद की जगह किसी विचार की सार्वभौमिकता की जिद करती हैं। गांधी-गोडसे संवाद में एक तरह से ऐसा कुछ नया नहीं, जिसे पहले न कहा गया हो। नया बस यह है कि नाटककार ने इसे दोहराने को अपने समय को बेहतर बनाने के लिए जरूरी माना है।

जहां एक तरफ़ गांधी-गोडसे संवाद सांप्रदायिकता के सवाल से जूझता है, वहीं आज के दौर के कई दूसरे मुद्दों को भी गांधीवादी दर्शन की कसौटी पर कसने की कोशिश इस नाटक में की गयी है। आत्मनिर्भर गांव महात्मा गांधी का सपना था। इस नाटक में गांधी के इस सपने की संभावना पर बात की गयी है। यह एक तथ्य है कि गांधी के ज्यादातर

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सिद्धांतों को नेहरूवादी विकास के मॉडल ने तिलांजलि दे दी थी। इस नाटक में लेखक ने कल्पना की है कि अगर गांधी जीवित रह जाते और अपने सिद्धांतों को अमल में लाने की कोशिश करते तो, तत्कालीन या मौजूदा शासन-व्यवस्था से उनका टकराव निश्चित था। केंद्रीकरण पर जोर देने वाली सत्ता, जो कि शासन से लेकर, बिल्ड और घोटालों तक पर अपना एकाधिकार मानती है, सत्ता को आम लोगों में बांटने और उनके सशक्तिकरण को खतरनाक मानती है। देश में आज भी ऐसे कई इलाके हैं, जहां स्थानीय लोग अपना शासन खुद चलाते जिन्हें आज रेड कॉरिडोर में शामिल किया जाता है (यानी नक्सल प्रभावित इलाकों में) यह महज एक नाटकीय युक्ति नहीं है कि कांग्रेस को विघटित कर, नेताओं को देश के दूर-दराज के हिस्सों में जाकर काम करने की सलाह देने वाले गांधी बिहार के एक आदिवासी गांव में जाकर अपना आश्रम बनाते हैं और वहां ग्राम स्वराज के सपने को साकार करते नजर आते हैं। नाटककार ने यह दिखाया है कि अगर गांधी जी जीवित होते और अपने आदर्शों को जमीन पर उतारने की कोशिश करते तो उसे एक किस्म का देशद्रोह माना जाता। ग्राम स्वराज को समानांतर सरकार स्थापित करने की कोशिश माना जाता। अपने जंगल और जमीन पर अपने हक का दावा करने वाले आदिवासी को आज की सरकार विद्रोही ही तो मानती है। सरकार यह भी भूल जाती है कि अपनी जमीन से बेदखल किये जाने की सूरत में बंदूक का रास्ता उठाने वाले लोग देश के ही नागरिक हैं। नागरिकों को ही देश का शत्रु मानकर उनके खिलाफ़ ऑपरेशन ग्रीनहंट की शुरुआत की जाती है। इन लोगों पर देश के कानून को तोड़ने का आरोप लगाया जाता है। तभी तो नाटक में गांधी कहते हैं-"सरकार हुकूमत करती है जवाहर..सेवा नहीं करती..सरकारें सिर्फ़ सत्ता की प्रतीक होती हैं और सत्ता सिर्फ़ अपनी सेवा करती हैं।"७यहां शासन के उस नेहरूवादी मॉडल के बरक्स गांधीवादी मॉडल की भी बात की गयी है। नाटक में गांधी नेहरू से कहते हैं-"जवाहर तुम पत्तों से जड़ तक जाने की बात करते हो और मैं जड़ से पत्तों की तरफ़ आने की बात करता हूं..मैं कहता हूं कि लोगों को ताकत दो, ताकि वे अपने लिए वे सब करें, जो जरूरी समझते हैं।८यही विकास के नेहरूवादी और गांधीवादी मॉडल के बीच का फ़र्क है। दलित, आदिवासी, स्त्री और अल्पसंख्यक समाज के अधिकार, उनके विकास और सांप्रदायिकता आदि मसले पर गांधी के विचारों को फ़िर से उठाने की पहल करने वाले इस नाटक को निश्चित तौर पर अपने समय और समाज में एक सजग रचनाकार की ओर से किया गया हस्तक्षेप कहा जा सकता है। असगर वजाहत द्वारा लिखित नाटक 'गोडसे@गांधी.कॉम' को मौजूदा दौर में गांधीवाद की संभावना की तलाश करने की गंभीर कोशिश कहा जा सकता है।

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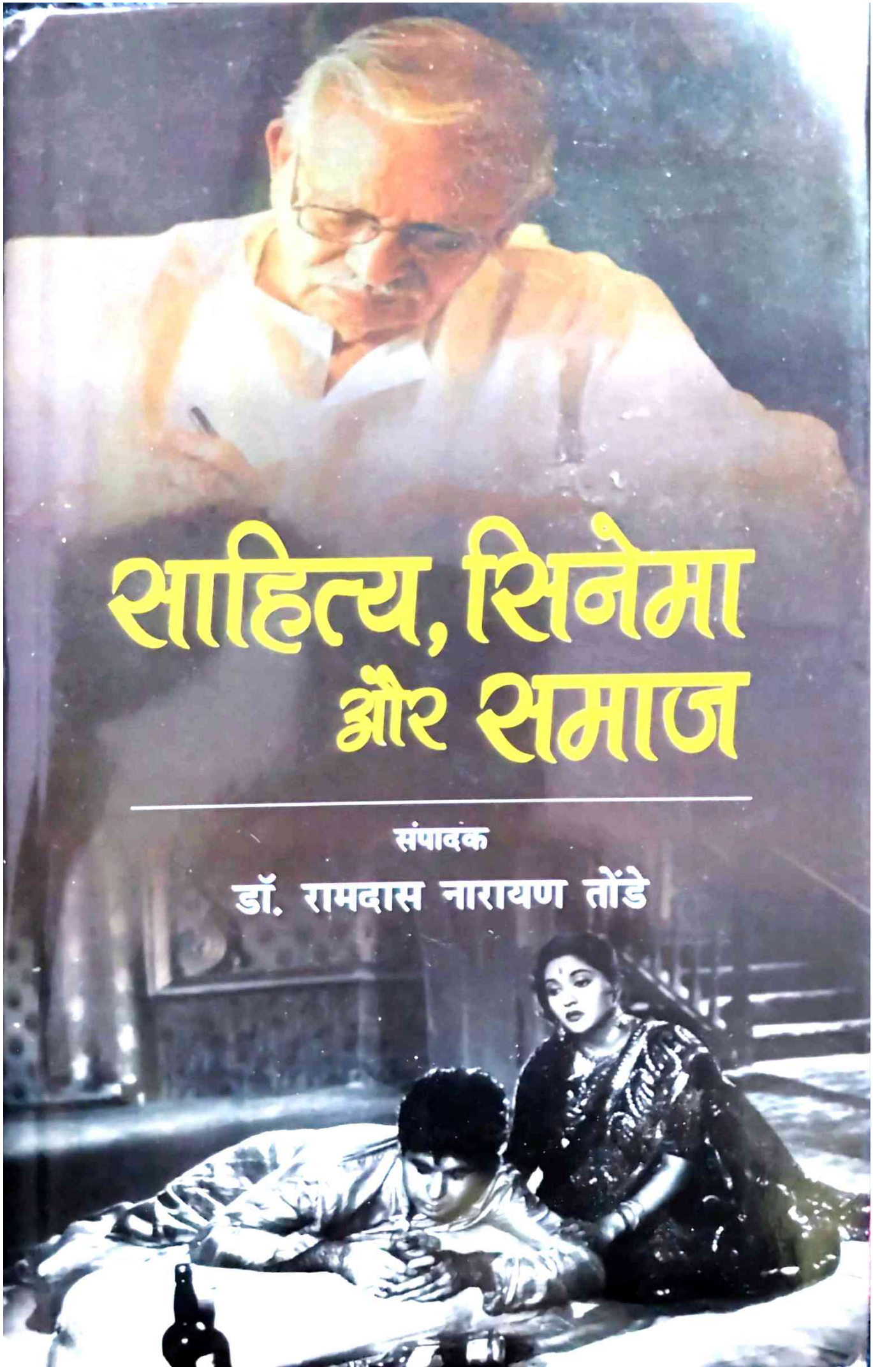

साहित्य, सिनेमा और समाज

संपादक

डॉ. रामदास नारायण तोंडे

साहित्य, सिनेमा और समाज

संपादक

डॉ. रामदास नारायण तोंडे

ए.आर. पब्लिशिंग कंपनी

दिल्ली

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डॉ. शेख अन्सारपाशा अब्दुलरज्जाक
विभागाध्यक्ष, हिंदी विभाग,
रिजवी कला, विज्ञान एवं वाणिज्य महाविद्यालय
बांद्रा पश्चिम, मुंबई

मानव जीवन और समाज को प्रभावित करने वाले विभिन्न माध्यमों में सिनेमा वह माध्यम है, जो समाज को प्रभावित करता है और प्रतिबिंबित भी करता है। भारत में सिनेमा को लगभग 110 साल हो चुके हैं। पिछले कई दशकों के फैलाव में कई पीढ़ियां सिनेमा में सक्रिय रही, उन्होंने अपने-अपने तरीके से सिनेमा को गढ़ा। सिनेमा में यह क्षमता पैदा की कि वह हमारे जीवन शैली का हिस्सा बन सके क्योंकि सिनेमा जहां समाज को प्रतिबिंबित करता है, वहीं निकलता भी इसी समाज से है। सिनेमा के भीतर समाज की मौजूदगी दिखती है, लोक दिखता है और उसमें सैकड़ो साल का अपना समाज कई रूपों में प्रतिबिंबित होता है। इस संदर्भ में डॉ. देवेन्द्रनाथ सिंह, डॉ. वीरेन्द्र सिंह यादव का कहना है कि, "हिंदी सिनेमा समाज का एक प्रमाणित और वैज्ञानिक दस्तावेज भले ना हो लेकिन एक समाज के भीतर से रिफ्लेक्ट होता है। हम सभ्यता के और समय के जिस बिंदु पर खड़े हैं, वहां सिनेमा हम पर असर डालता है। हमारे जिंदगी को बनाने-बिगाड़ ने की कोशिश करता दिखता है। साथ ही दृश्य-श्रवण का यह माध्यम हमारी ज्ञानेंद्रिय से अनुभूत 90 प्रतिशत सूचनाओं को मस्तिष्क तक पहुंचने में सक्षम होता है। निश्चय ही फिल्में वह माध्यम हैं, जो समाज में दर्पण, दीपक और दिगसूचक तीनों की भूमिका निभाती है।"[1] यदि हम हिंदी सिनेमा के परिप्रेक्ष्य में देखें तो स्वतंत्रता के बाद की अधिकांश फिल्में लाभ के मसौदे के लिए तैयार न होकर जन सरोकार और जन पक्षधर मूल्यों को समर्पित थी। सामाजिक, सांस्कृतिक एवं राजनीतिक संचेतना का निर्माण इनका मुख्य लक्ष्य था, "जब हम भारतीय सिनेमा की बात करते हैं, तो हमारे दिमाग में भारत की संस्कृति, सभ्यता, इतिहास और

भाषा पहले आती है क्योंकि भारतीय सिनेमा का इन सब से बहुत गहरा नाता है। जैसे-जैसे वक्त बदल रहा है, वैसे-वैसे सिनेमा का रूप बदल रहा है। सभ्यता, संस्कृति, भाषा और इतिहास को सिनेमा जगत में बड़ी खूबसूरती से दर्शाया गया है। रिश्तों की खूबसूरती तो कभी उलझे हुए रिश्ते भी फिल्मों में देखने को मिलते हैं, जो कहीं ना कहीं हमारी निजी जिंदगी पर आधारित होते हैं। जिनकी कहानी हमें हमारी जिंदगी से जुड़ी हुई लगती है, बदलते हुए समाज का रूप-रंग और स्वरूप हमें भारतीय सिनेमा में बखूबी देखने को मिलता है।''[2]

सिनेमा ने हमेशा भारतीय समाज को एक विस्तृत क्षितिज प्रदान किया है। सिनेमा ने समकालीन दौर की परिस्थितियों, चिंताओं और संघर्ष की अभिव्यक्ति पूरे आत्मविश्वास तथा दृढ़ता से की है। सिनेमा ने अक्सर समाज की दशा को दिशा देने का काम भी बखूबी किया है, फिर चाहे देश में व्याप्त सामाजिक रूढ़ियों एवं कुरीतियों पर प्रहार करने की बात हो या बेरोजगारी, बेगारी, गरीबी, अशिक्षा की समस्या को प्रमुखता से सामने रखने की बात हो, ''फिल्म जगत ने फिल्मों के माध्यम से समाज में सांप्रदायिक एवं जातिगत सौहार्द का वातावरण बनाने में भी अपनी भूमिका के साथ न्याय किया है। यही नहीं अनेक व्यवस्थाजन्य समस्याओं जैसे उग्रवाद, नक्सलवाद, आतंकवाद की तह तक पहुंचने तथा जनादेश को समझने में तथा सामंतवादी व्यवस्था, लाल फीता शाही और भ्रष्टाचार के विरुद्ध जनाक्रोश एवं विद्रोह को हथियार बना उसके विरुद्ध में माहौल बनाने में, साथ ही साथ उनके संभावित समाधानों को दिखाने में भी फिल्म जगत ने अमूल्य योगदान दिया है।''[3] फिल्मों ने देश के हर वर्ग में भाईचारे और देश भक्ति की भावनाओं को प्रसारित करने में भी अहम भूमिका निभाई है। बाजारीकरण, पाश्चात्य चलन एवं सामाजिक ताने-बाने के बदलाव ने परिवारों की टूट तो बढ़ा दी है लेकिन समाज, परिवार एवं माता-पिता के महत्व को फिल्मों के माध्यम से बार-बार प्रमुखता से दर्शाकर फिल्म जगत ने पारंपरिक भारतीय मूल्यों को बचाकर रखने में भी काफी मदद की है।

फिल्मों ने आज जहां नारी को बाजार में खड़ा कर दिया है वहीं फिल्मों के माध्यम से ही नारी के महत्व एवं समाज के उसके विभिन्न स्वरूपों को महिमा मंडित करने के प्रयास भी किए गए हैं। इसके अलावा क्षेत्रीय या देशज भाषाओं एवं राष्ट्रभाषा के उत्थान एवं उन्हें निकट लाने में फिल्मों का अभूतपूर्व योगदान रहा है। इसी तरह गीत, संगीत, नृत्य को परिचय देने तथा आगे बढ़ाने में फिल्मों का विशेष योगदान रहा है। अतः सिनेमा ने समाज को बहुत कुछ दिया है, इस बात से इनकार नहीं किया जा सकता।

हिंदी फिल्मों का शुरूआती दौर : पौराणिक कथाओं पर आधारित फिल्में

भारतीय सिनेमा के पितामह महाराष्ट्र, नासिक के 'दादासाहब फाल्के' जी ने हिंदू पौराणिक चरित्र 'राजा हरिश्चंद्र' के जीवन पर 'राजा हरिश्चंद्र' नामक पहली फीचर फिल्म बनाई जिसका पहले सार्वजनिक प्रदर्शन 3 मई 1913 को कोरोनेशन थिएटर में हुआ हालांकि दादासाहब तोरने द्वारा निर्देशित फिल्म 'पुंडलिक' का प्रदर्शन 18 मई 1912 को मुंबई के कोरोनेशन थियेटर में ही हुआ था किंतु इस फिल्म को पहली भारतीय फिल्म का दर्जा नहीं मिला। दादासाहब फाल्के ने स्वयं 'हिंदुस्तान फिल्म' नाम से कंपनी की स्थापना की थी। जिसके तहत उन्होंने लगभग 95 फीचर फिल्में और 26 लघु फिल्में बनाई। उनके द्वारा बनाई प्रायः सभी फीचर फिल्में पौराणिक कथाओं पर आधारित थी। इसका कारण यह था कि तत्कालीन भारतीय समाज में नाटक और फिल्में देखना उतना अच्छा नहीं माना जाता था। ऐसे समय में धार्मिक और पौराणिक फिल्मों के माध्यम से ही दर्शकों को सिनेमा की ओर आकर्षित किया जा सकता था।

सामाजिक विषयों का आधार

धीरे-धीरे लोगों की रुचि के अनुसार सामाजिक विषयों को आधार बनाकर फिल्में बनाई जाने लगी। इसमें बाबूराव पेंटर का नाम उल्लेखनीय है जिन्होंने 1925 में 'सावकारी पाश' नामक फिल्म बनाई थी। जो किसानों के कर्ज की समस्या पर आधारित थी। इसके पश्चात फिल्म निर्माण के क्षेत्र में मुख्यतः तीन और फिल्म कंपनियों का निर्माण हुआ जिसमें 1929 में कोल्हापुर में 'प्रभात फिल्म' कंपनी की स्थापना की गई। इसकी स्थापना करने वालों में वी. शांताराम, विष्णुपंत दामले, एस. फत्तेलाल आदि शामिल थे। इस फिल्म कंपनी ने हिंदी और मराठी में कई सामाजिक दृष्टि से उद्देश्य पूर्ण फिल्में बनाई। इसके साथ ही 1929 में बी. एन. सरकार ने कोलकाता में 'न्यू थियेटर्स' फिल्म कंपनी की स्थापना की जिससे नितिन बोस, पी.सी. बरुआ, अमर मलिक, देवकी बोस, के.एल. सहगल, केदार शर्मा, विमल राय, ऋषिकेश मुखर्जी जैसे महान फिल्मकार जुड़े रहे। इन्होंने बांग्ला और हिंदी में कई महत्वपूर्ण फिल्में बनाई। 1930 में हिमांशु राय द्वारा स्थापित 'बॉम्बे टॉकीज' से भी कई बड़े कलाकार जुड़े रहे।

राजनीतिक मुक्ति एवं सामाजिक समता का आधार

20वीं शताब्दी के दूसरे दशक की फिल्मों का विषय धार्मिक एवं पौराणिक था

किंतु 1936 के बाद प्रेमचंद युग अर्थात प्रगतिशील विचारधारा के लेखन के साथ ही फिल्मों के विषय में भी परिवर्तन हो गया। स्वाधीनता का राष्ट्रीय आंदोलन जन आंदोलन में बदल चुका था इसमें किसान, मजदूर, दलित और स्त्रियों की भागीदारी भी बढ़ती जा रही थी। राजनीतिक मुक्ति के पर्याय के साथ ही लोग सामाजिक समता की मांग कर रहे थे। इसी माहौल से प्रभावित होकर प्रभात फिल्म कंपनी की ओर से वी. शांताराम ने 'अमृत मंथन' य 1934 में फिल्म बनाई जिसमें पशु बलि की समस्या को उठाया गया। इसी साल बनी मोहन भावनानी की 'मजदूर' फिल्म, जिसकी पटकथा प्रेमचंद ने लिखी थी, इस फिल्म में पूंजीपतियों और व्यापारियों की विरोध में मजदूरों के अधिकारों को विषय बनाया गया।

मध्यमवर्गीय जीवन में आने वाले बदलावों और संघर्ष का आधार

बॉम्बे टॉकीज' ने 1936 में 'अछूत कन्या' फिल्म के माध्यम से सवर्ण नायक और अछूत नायिका की प्रेम कहानी द्वारा जातिगत भेदभाव का प्रश्न उपस्थित किया था। 1940 के बाद फिल्म उद्योग काफी विस्तार ग्रहण कर चुका था। इस बीच अनेक महत्वपूर्ण फिल्मकार हिंदी सिनेमा के क्षेत्र में सक्रिय हुए थे, जिनमें विमल राय, केदार शर्मा, महबूब खान, सोहराब मोदी, ख्वाजा अहमद अब्बास, राज कपूर, चेतन आनंद, कमल अमरोही, बी. आर. चोपड़ा, यश चोपड़ा आदि प्रमुख थे। इस समय की फिल्मकारों ने विशिष्ट सामाजिक उद्देश्य को केंद्र में रखकर फिल्में बनाई। जिसमें रोटी (1942), आंखें (1944), प्रतिमा (1945), मेरा सुहाग (1947), जेल यात्रा (1947), अदालत (1948), नरसिंह अवतार (1949), आदि प्रमुख हैं। इन फिल्मों में मध्यमवर्गीय जीवन में आने वाले बदलावों और संघर्ष को ही नहीं बल्कि समाज के पददलित वर्गों के जीवन को भी विविधता के साथ पेश किया गया।

नायक, नायिका और खलनायक वाले प्रेम त्रिकोण का आधार

1950 के बाद फिल्मों में निर्देशकों का महत्व अधिक बढ़ गया। अभिनय में यथार्थवादिता को महत्व प्राप्त हुआ। दिलीप कुमार जैसे अभिनेताओं ने उस समय अपना प्रभाव दिखाया। इस समय के नायिकाओं में नरगिस, मीना कुमारी, नूतन, मधुबाला, वहीदा रहमान आदि प्रमुख थी। 1960 के बाद अधिकतर फिल्में नायक केंद्रित बनने लगी। नायक, नायिका और खलनायक वाले प्रेम त्रिकोण की कहानियां फिल्मों में दिखाई देने लगी। नायक को ग्लैमराइज किया जाने लगा। इस दौर में शमी कपूर, जॉय मुखर्जी, विश्वजीत, राजेश खन्ना, शशि कपूर आदि प्रमुख

नायक थे। 1970-80 के दशक में फिल्में व्यवसायिकता की ओर मुड़ने लगी। अभिनेताओं को मुंह मांगा पैसा मिलने लगा और वितरकों ने अपना दबाव बनाना शुरू कर दिया। गीत, संगीत, नृत्य, रोमांस, अभिनय में आमूलाग्र बदलाव होने लगा। व्यवसायिकता और रचनात्मकता का स्पष्ट भेद फिल्मों में दिखाई देने लगा। 1975 में बनी 'शोले' फिल्म जिसका बजट 2 से 3 करोड़ माना जाता है, उस वक्त की बिग बजट फिल्म थी। जिसने लगभग 15 करोड़ का व्यवसाय करते हुए सभी फिल्मों का रिकॉर्ड तोड़ दिया था।

व्यावसायिक और रचनात्मक फिल्मों का दौर

1990 के बाद फिल्मों में दो धाराएं दिखाई देने लगी। व्यावसायिक और रचनात्मक फिल्में बनने लगी। व्यावसायिक फिल्में प्रायः यथास्थितिवादी थी। जबकि रचनात्मक फिल्मों में सामाजिक बदलाव के संकेत दिखाई दे रहे थे। इस समय के प्रमुख नायकों में अमिताभ बच्चन, जितेंद्र खन्ना, मिथुन चक्रवर्ती आदि प्रमुख थे। इस वक्त की नायिकाओं में रेखा, जया, हेमा मालिनी प्रमुख रही हैं, तो प्रेम चोपड़ा, गुलशन ग्रोवर, परेश रावल, अमरीश पुरी, शक्ति कपूर आदि ने खलनायकों का किरदार निभाया है। 20वीं सदी के अंतिम दशक में आमिर खान, सलमान खान और शाहरुख खान आदि खान मंडली के साथ ही अजय देवगन, अक्षय कुमार जैसे नायकों ने फिल्म इंडस्ट्री पर अपना प्रभाव बनाए रखा है। माधुरी दीक्षित, करिश्मा कपूर, काजोल के पश्चात ऐश्वर्या राय, सुष्मिता सेन, करीना कपूर, कैटरीना कैफ, प्रियंका चोपड़ा, दीपिका पादुकोण तथा अनुष्का शर्मा जैसी नायिकाओं ने अपना जलवा दिखाया है।

अश्लीलता और उसके बाद का समय

वस्तुतः समय के साथ तीव्र गति से परिवर्तित होती हिंदी फिल्मों का पूरा रूप ही पलट गया है। फिल्म लेखन में निर्देशक, अभिनेता, अभिनेत्रियां यहां तक की कैमरामन को भी निर्देशक की दृष्टि पर निर्भर रहना पड़ता है। दर्शकों की रुचि भी बदल गई है। कथा, गीत, संगीत, अभिनय और भाषा आदि सभी स्तरों पर फिल्मों का कलेवर ही बदल गया है। संगणक, इंटरनेट और सूचना प्रौद्योगिकी के कारण फिल्में कम समय में बनाई जाने लगी हैं। जिसमें वास्तविकता कम और कल्पना का विस्तार ज्यादा दिखाई देने लगा है। सीडी और इंटरनेट के माध्यम से ये फिल्में घर-घर तक बल्कि विश्व के कोने-कोने तक एक साथ पहुंच रही है। फैशन परस्त पाश्चिमात्य संस्कृति के अनुकरण से फिल्मों में बहुत ही छिछलापन, अश्लीलता

और निरर्थकता आने लगी हैं। जो फिल्में कभी सामाजिक सुधार का आधार थी। उसमें आज समाज विघातक दृश्य दिखाई देते हैं. आज की ज्यादातर फिल्में ऐसी बनाई गई हैं, जिसको परिवार के सभी सदस्य एकत्रित बैठकर देख नहीं सकते। जैसे, चांदनी बार (2001), लज्जा (2001), चमेली (2004), गर्लफ्रेंड (2004), पेज थ्री (2005), चीनी कम (2007), हनीमून ट्रेवल्स प्रा.लि. (2007), लागा चुनरी में दाग (2007), निःशब्द (2007), फैशन (2008), लक बाई चांस (2009), इश्किया (2010), लव, सेक्स और धोखा (2010), मर्डर-2 (2011), द डर्टी पिक्चर (2011), सात खून माफ (2011), जिस्म-2 (2012), इश्कजादे (2012), हिरोइन (2012), शुद्ध देशी रोमांस (2013), इनकार (2013), साहब, बीबी और गैंगस्टर रिटर्न (2013), रागिनी एम.एम.एस. (2014) आदि फिल्में इस बात को प्रामाणित करती हैं कि हिंदी सिनेमा अश्लीलता से अधिक मुखर होने लगा है।

अश्लील शरीर प्रदर्शन और घिनौने नृत्य का विपरीत असर युवा पीढ़ी पर हो रहा है। यह फिल्में सच्चाई की जमीन से काफी दूर जाती हुई दिखाई दे रही हैं। हां एक बात जरूर है कि हॉलीवुड की फिल्मों से भी बॉलीवुड की फिल्में देखने वालों की संख्या विश्व में बढ़ती जा रही है। किंतु संस्कृति, सभ्यता और सामाजिक पतन के साथ व्यावसायिक दृष्टिकोण के तहत सामाजिक दायित्व के निर्वहन की चुनौती आज भी बनी हुई है।

विशेष सन्दर्भ 'दंगल'

'दंगल' कहानी है हरियाणा के एक छोटे से गांव के भूतपूर्व नैशनल रेसलिंग चौंपियन महावीर सिंह फोगाट (आमिर खान) की। घर की कमजोर आर्थिक स्थिति की वजह से अपने रेसलिंग के करियर पर विराम लगा नौकरी चुनने वाले महावीर के सीने में देश के लिए गोल्ड मेडल जीतने की चाहत हमेशा कचोटती है। अपनी गोल्ड मेडल जीतने की चाहत को वह अपनी बेटियों से पूरा करवाता है। पुरुष प्रधान समाज में बेटियों से पहलवानी करवाना और अंतरराष्ट्रीय मंच पर बेटियों के गोल्ड मेडल जीतने की इस दिलचस्प कहानी में प्रेरणादायक मनोरंजन हैं।

महावीर फोगाट की शादी शोभा कौर (साक्षी तंवर) से होती है। महावीर की चाहत है कि उसे एक बेटा हो, जो उनके लिए किसी इंटरनैशनल इवेंट से गोल्ड मेडल जीतकर ला सके। इसी चाहत में उन्हें चौथी बार भी बेटी ही होती है, जिसके बाद वह काफी दुखी हो जाता है। अचानक एक दिन उनकी दोनों बेटियां गीता (बचपन का किरदार में जायरा वसीम और बड़ी होकर फातिमा सना शेख) और बबीता (बचपन के किरदार में सुहानी भटनागर और बड़ी होकर सान्या मल्होत्रा)

पड़ोस के बच्चों को बुरी तरह पीटकर आती हैं और यहीं से महावीर के मन में जगती है, अपनी बेटियों को बेटा बनाने की चाहत। वह कहते नजर आते हैं, 'म्हारी छोरियां छोरों से कम है के?' यहीं से शुरुआत होती है उस लगन और मेहनत की जो महावीर को उसके मंजिल तक पहुंचाती है। हालांकि, यह सब कर पाना इतना आसान नहीं होता, काफी मुश्किलें सामने हैं, लेकिन महावीर हर परिस्थितियों पर बिल्कुल पहाड़ की तरह भारी नजर आते हैं। उन्हें अपने चारों तरफ अपनी बेटियां और गोल्ड मेडल के आलावा कुछ और नहीं सूझता।

नितेश तिवारी ने महावीर फोगाट की बेटियों गीता और बबीता की ऐतिहासिक जीत की जगजाहिर कहानी के बावजूद फिल्म का बेहतरीन निर्देशन किया है। इसका स्क्रीनप्ले, डायलॉग और ट्रीटमेंट दर्शकों को पूरे समय बांधे रखता है। फिल्म के कई सीन जहां आपकी आंखों को नम कर देते हैं, वहीं बीच-बीच में इमोशन से भरपूर हरियाणवी डायलॉग हंसी और खुशी का सामंजस्य बना कर रखते हैं।

ऐक्टिंग की बात की जाय तो दंगल में आमिर खान ने महावीर फोगाट के रूप में जवान बेटियों के पिता बनने का किरदार बेहतरीन ढंग से निभाया है, उनकी बेटियों के किरदार में फातिमा सना शेख, सान्या मल्होत्रा, जायरा वसीम और सुहानी भटनागर ने भी कमाल का अभिनय किया है। साक्षी तंवर और अपारशक्ति खुराना ने अपनी सहज अदाकारी से हर सीन में जान फूंक दी है।

जहां फिल्म के पहले भाग में ज्यादातर शूटिंग आउटडोर की है, वहीं दूसरे भाग में अधिकतर सीन स्टेडियम के हैं। स्टेडियम में रेसलिंग के लंबे-लंबे सीन आपको किसी भी समय बोझिल नहीं लगते। पहलवानी के खेल से वाकिफ न रहने वाले दर्शक भी फिल्म में बड़ी ही आसानी से रेसलिंग के दांव-पेंच को समझ लेते हैं, इसलिए फिल्म रोचक लगती है। कई बार तो रेसलिंग के सीन पर हर जीत के बाद सिनेमा हॉल तालियों की गड़गड़ाहट से गूंज उठता है। वहीं संगीत की बात करें तो फिल्म के गीत-संगीत को प्रीतम ने इस तरह पिरोया है कि हर गाना फिल्म की कहानी को आगे बढ़ाता है। गीतकार अमिताभ भट्टाचार्य के गीत कहानी में डूबकर साथ चलते हैं। फिल्म का बैकग्राउंड स्कोर विषय से भटकता नहीं है, कई बार जब रेसलिंग के दांव-पेंच शुरू होते हैं तब बैकग्राउंड स्कोर पर कोई संगीत नहीं है, बैकग्राउंड स्कोर की यही बात फिल्म को और मजबूत बनाती है।

हिंदी फिल्म 'दंगल' में वर्तमान समय के सरोकार

'दंगल' फिल्म में आर्थिक सरोकार

खिलाड़ियों का आर्थिक स्थिति के साथ संघर्ष करना नया नहीं है। फिल्म के शुरुआत में ही आमिर खान अभिनीत महावीर सिंह फोगाट की आर्थिक स्थिति कमजोर है, यह प्रतीत होता है। वह अपनी तमाम इच्छाओं और आकांक्षाओं का गला घोटकर सरकारी नौकरी करता दिखाई देता है। खेल के प्रति सरकार की उदासीनता को भी दर्शाया गया है। जिसमें कुश्ती जैसे खेल के तो और भी बुरे हाल हैं। खेल के बजट को लेकर भी सवाल उपस्थित किए गए हैं। अगर उत्कृष्ट खेल की चाहत है तो खिलाडियों को बेहतर सुविधाएं देनी आवश्यक है तभी वह अपने खेल में और बेहतर प्रदर्शन कर सकते हैं।

'दंगल' फिल्म में सामाजिक सरोकार

लैंगिक रूढ़िवादिता को चुनौती देती 'दंगल' फिल्म की कहानी सत्य घटना पर आधारित है। जो हरियाणा के एक जुझारू पहलवान महावीर सिंह फोगाट और उनकी रेसलर बेटियों के संघर्ष को बयां करती है। फोगाट परिवार में कुश्ती विरासत के रूप में मिली थी जिसे महावीर सिंह फोगाट और उनके चार लड़कियां आगे बढ़ाती है। पुरुष प्रधान मानसिकता वाले गांव में लड़कियों को रेसलर बनाने की पिता की महत्वाकांक्षा, इसमें आई कठिनाइयां, सामाजिक बहिष्कार, बाप बेटियों की हाड़तोड़ मेहनत और अपने सपने को पूरा करने के हकीकत को फिल्म में सजीवता से दर्शाया गया है। हरियाणा के महावीर सिंह फोगाट पुराने जमाने के एक अच्छे पहलवान और ओलंपिक कोच रहे हैं, उनके चारों बेटियों ने महिला रेसलिंग में दबदबा बनाया है। आज राष्ट्रीय-अंतरराष्ट्रीय महिला रेसलिंग के आसमान पर फौगाट भगिनियों का नाम सितारों की तरह जगमगा रहा है। जिसके कारण महावीर सिंह फोगाट को भारत सरकार की ओर से द्रोणाचार्य पुरस्कार से सम्मानित किया गया है।

'दंगल' फिल्म में धार्मिक सरोकार

हरियाणवी संस्कृति में बेटों को बड़ा महत्व है। जब महावीर सिंह फोगाट को बेटा नहीं होता तो वह पुत्र प्राप्ति हेतु पंडितों के पास जाकर मिन्नतें करता दिखता है, तो उसकी पत्नी को धार्मिक किस्म की अशिक्षित महिलाएं अपने हिसाब से टोटके बताती हैं, परंतु उसका कोई उपयोग नहीं होता।

'दंगल' फिल्म में शैक्षिक एवं सांस्कृतिक सरोकार

दंगल एक लुप्त होती सामंतवादी व्यवस्था और उस ग्रामीण समाज की जेंडर भूमिकाओं पर एक खास टिप्पणी है। खासकर हरियाणवी ग्रामीण समाज पर जहां ज्यादातर ग्रामीण लड़कियों के पालन-पोषण और सामाजिक भूमिकाएं अभी भी उनके जेंडर से निर्धारित होती है। दंगल फिल्म का सामाजिक मैसेज सिर्फ एक मिनट का है। इस मैसेज को एक बालिका वधु के मुंह से नॉन प्रीस्किप्टिव अंदाज में दिया गया है। बाकी फिल्म तो हरियाणा के साधारण, निम्न मध्य वर्गीय परिवार की इच्छाओं और उसकी पीछे के संघर्षों की मार्मिक कहानी भर है। फिल्म में स्त्री शिक्षा के प्रति खुलापन तो है लेकिन महिलाओं पर कम उम्र में शादी करने का दबाव डाला जाता है। फिल्म में गीता और बबिता के साथ पढ़ने वाली लड़की की कम उम्र में उससे उम्र में बढ़े आदमी के साथ जबरन शादी करा दी जाती है। वह अपने सहेलियों से इस संदर्भ में रो-रोकर बताती है कि उसकी इच्छा आगे पढ़ने की है मगर उसके परिवार के लोग उसकी शादी करा दे रहे हैं वह उनसे कहती है-तुम लोग तो कितने खुशकिस्मत हो कि तुम्हें अपने पैरों पर खड़ा करने के लिए तुम्हारे पिता पुरे समाज से संघर्ष कर रहे हैं।

शादी का वह सीन बेहद ही महत्वपूर्ण है क्योंकि उसी घटना के पश्चात् ही गीता और बबिता में पहलवानी करने के लिए आत्मिक उर्जा का संचार होता है। अपने पिता की मेहनत और उम्मीदों को पूरा करने के लिए वे दोनों कमर कसती हैं।

'दंगल' फिल्म में राजनीतिक सरोकार

फिल्म का पहला भाग इस बारे में है कि कैसे बूढ़ा पिता अपनी बेटियों को कुश्ती के पारंपरिक शैली के बारे में सब कुछ सिखाता है, और दूसरा यह है कि कैसे राष्ट्रीय अकादमी में एक कोच उस तकनीक के साथ खिलवाड़ करने और उसे और अधिक आधुनिक बनाने की कोशिश करता है। यह नया तरीका कुश्ती के जुनून को खत्म कर देता है और उनकी कुश्ती में एक रक्षात्मक शैली पेश करता है। पलटवार करने की बजाय रक्षात्मक रवैया अपनाने के कारण जितने वाले सभी मैच तूने हार दिए यह बताते हुए आखिकार बुढा पिता मैदान में उतरकर दांवपेंच बताने की, उनका हौसला बढाने की कोशिश करता है तो कोच को बहुत बुरा लगता है और वह षडयंत्र करके पिता को कमरे में कैद करवाता है।

इससे अकादमी के कोच की राजनीति का स्पष्ट चित्र उभरता है। वर्चस्व पाने के लिए एक व्यक्ति किस हद तक जा सकता है इसका पता चलता है।

आधिकारिकता पाने की लालसा व्यक्ति को पद, प्रतिष्ठा, पैसा और राष्ट्रीयता से दूर कर देती है।

अतः कहा जा सकता है कि 'दंगल' फिल्म के अंतर्गत वर्तमान समय के तमाम सरोकार मौजूद हैं।

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A STUDY ON DIFFERENT ASPECTS OF SHARIAH FINANCE BASED CAPITALMARKET WITH REFERENCE TO FINTECH (AI)

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ABSTRACT
The Shariah-based capital market is a pivotal component of Islamic finance, adhering to Shariah law's ethical principles. This market offers various investment avenues, including equities, Sukuk (bond), derivatives, unit trusts, ETFs, REITs, commodity funds, and Takaful (insurance), all in compliance with Islamic tenets. The market's resilience and growth, exemplified by theflourishing Sukuk market and innovative Shariah-compliant products, reflect its global significance. Regulatory bodies, scholars, and financial institutions shape and regulate these markets, emphasizing ethical finance, transparency, and mutual cooperation. As investors increasingly seek responsible investment options, Shariah-based capital markets promote financial inclusion and sustainable development, embodying values of fairness, integrity, and social responsibility in the global financial system.

Keywords: Islamic Finance, Shariah, Takaful, Sukuk

INTRODUCTION
The Shariah-based capital market, guided by Islamic principles, eschews interest-based transactions and invests ethically, attracting diverse investors globally. It surpassed USD 2.05 trillion in 2017, with Sukuk (bond) issuance hitting USD 399.9 billion. This growth underscoresconfidence in Shariah-compliant finance, fostering ethical investments and financial inclusion. Understanding its mechanisms and trends illuminates its role in promoting sustainable economicdevelopment.

MEANING
Islamic Finance aligns with Shari'ah law, forbidding interest, excessive uncertainty, gambling, and harmful transactions. It emphasizes ethical conduct, transparency, and social responsibility in

1) Shariah-Based Equity Markets

Financial services and investments.

In the realm of finance, Shariah-based equities embody the ethical heartbeat of mpanies aligned with Islamic principles. These securities mirror businesses engaged in Shariah-compliant activities, bearing the stamp of approval from Islamic scholars through rigorous stock screening. For a company to earn the coveted title of Shariah-based, itsrevenue must steer clear of non-compliant domains like alcohol, gambling, or interest-based dealings. Malaysia, with its pioneering Shariah Advisory Council, standstall in fostering this ethical financial landscape. Amidst global authorities and institutes, each crafts unique screening norms, illuminating the path toward ethical investment.

2) Sukuk (Bond) Soaring: A Harmonious Crescendo in Islamic Finance
In the dynamic symphony of Islamic finance, the Shariah-based Sukuk market stands out as a crescendo of growth. From 2001 to 2007, Sukuk witnessed a dazzling 84% annual compound growth, reaching a valuation of $80-90 billion. The 2008 subprime crisis cast amomentary shadow, causing a dip to $14 billion in the initial eight months. Sukuk, derived from the Arabic "sakk," meaning certificate, epitomizes trust in asset ownership, distinguishing itself from conventional bonds by abstaining from interest payments.

Easily traded and imbued with liquidity, Sukuk embodies real assets, offering investorsdiverse income options through instruments like Salam, Bai-muajjal, and Ijarah.

3) Shariah-Based Derivatives
In the ever-evolving landscape of Islamic finance, the rise of Shariah-based derivative instruments emerges as a powerful chord in risk management. These instruments, craftedwithin the principles of Shariah law, encompass profit rate swaps, structured options rooted in the art of promise (wa'd), and innovative tools like the Islamic FX outright andforeign exchange wa'd. Underpinned by contracts such as bai salam and bai istisna, Shariah-based derivatives diverge from traditional counterparts by disallowing speculation or maisir (gambling). Designed for hedging and arbitrage, these instruments harmonize financial growth while upholding Islamic principles, shunning riba and excessive uncertainty.

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4) Shariah-Based Unit Trus

In the symphony of financial instruments, Shariah-based unit trusts strike a unique chord. Unlike their conventional counterparts, these trusts exclusively dance to the rhythm of Shariah-compliant stocks and securities, embracing Murabahah, Musharakah, and innovative structures like bai salam. With a diverse sphere

of investments spanning leasing, public works, and real estate, they navigate the melodyof short-term, medium-term, and long-term commitments. Categorized by risk, these trusts offer low, medium, and high-risk tunes, tailored to open-ended or closed-ended funds. Governed by the harmonious concept of "Bai'al naqdi," these trusts orchestrate financial growth.

5) Shariah-Based Exchange Traded Funds

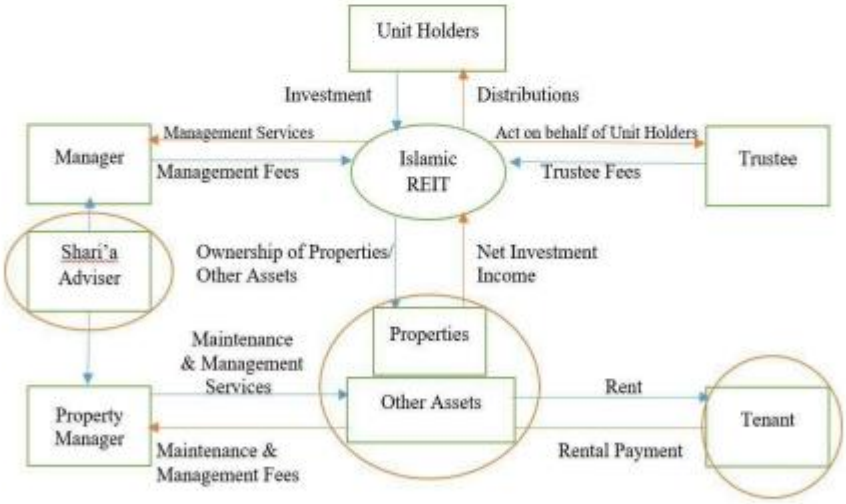
Launched in February 2006, Shariah-based Exchange Traded Funds (ETFs) represent a paradigm shift in the world of finance. Unlike traditional counterparts, these ETFs are a dynamic interplay of quoted securities meticulously chosen to mirror benchmark indices.

What sets them apart is adherence to Shariah-compliant stocks, and passing rigorous screening processes for ethical engagement. Trading on the stock exchange adds a layer of flexibility, allowing investors tax efficiency, cost-effectiveness, and transparent clarity.In this financial ballet, Shariah-based ETFs emerge as a harmonious blend of innovation,ethics, and investor-friendly advantages.

6) Shariah-Based Reits

In the intricate realm of finance, Shariah-based Real Estate Investment Trusts (REITs) take centre stage, mirroring their traditional counterparts with a touch of ethical finesse.Designed as property trusts, these REITs adhere zealously to the principles of Islamic laws, notably the rule of ijarah—utilizing lease financing for property acquisition. Theirportfolio extends beyond physical real estate, encompassing Sukuk, real estate from private firms, and assets from Shariah-based companies. Malaysia led the way in 2006 with the groundbreaking issuance of $130 million by the Malaysian Al-Aqar, marking aharmonious blend of financial innovation and Shariah principles.

7) Structure of an Islamic Reits



Source: Jaafar (2007).

8) Shariah-Based Commodity Funds

In the tapestry of Shariah finance, Commodity Funds emerge as ethical voyagers navigating the seas of trade. Upholding Islamic principles, these funds embark on a journey through meticulous Shariah screening, ensuring only halal commodities grace their portfolio. Guided by Usmani's rules, the seller's ownership dance, a prohibition onshort sales, and the nuanced allowance for forward sales within the realms of bai salamand bai

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istisna paint a picture of ethical clarity. Commodity dealings veer away from forbidden territories like pork and wine, embracing a realm where transparency in possession and fixed prices reign supreme. Welcome to the realm where ethical trade meets financial seas.

9) Shariah-Based Indices

In the cosmic realm of finance, the DJIM Index and T11-FTSE Islamic Index emerged as the pioneering constellations in 1999 and 2000, casting a Shariah-compliant glow worldwide. MSCI and S&P, enchanted by this celestial dance, joined in, crafting their own benchmarks. S&P's symphony included the S&P 500 Shariah Index, S&P Japan 500 Shariah Index, and the S&P Europe 350 Shariah Index from 2006. MSCI, a luminary, gifted the financial galaxy with three radiant indices: MSCI Emerging Markets Islamic Indices, MSCI USA Islamic Index, and MSCI World Islamic Index. Meanwhile, Indonesia's bourse birthed the Jakarta Islamic Index, a star-studded spectacle since 2000.The financial cosmos, aglow with Shariah brilliance, continues to captivate the investment universe.

10) Quantitative Screens of Major Islamic Index Families

Major Islamic index families, like DJIM, T11-FTSE, S&P, and MSCI, embark on a journey through quantitative screens, defining the celestial order in the Shariah-compliant universe. DJIM Index: Launched in 1999, DJIM uses rigorous screens, to evaluate financial ratios, debt levels, and business activities. Only firms meeting Shariah principles earn a place in this exclusive galaxy. T11-FTSE Islamic Index: Illuminating the heavens since 2000, T11-FTSE employs meticulous criteria. Corporations with debt ratios below set limits and no engagement in prohibited sectors dance in this divine constellation.S&P Shariah Indices: S&P's symphony of Shariah screens, such as the S&P 500 Shariah Index, harmonizes financial data, ensuring compliance with Islamic tenets. Prohibiting interest-driven earnings, it charts a virtuous trajectory.MSCI Islamic Indices: Pioneering MSCI crafted three enchanting indices—MSCI Emerging Markets, MSCI USA, and MSCI World Islamic. These indices orbit within strict parameters, omitting firms entangled in impermissible activities.As these Islamic index families weave their quantitative spells, investors traverse the cosmos guided by the virtuous glow of Shariahcompliance.

11) Shariah-Based Takaful (Insurance)

In the tapestry of Islamic finance, Takaful emerges as a luminary, casting its glow on the shadows of traditional insurance. Guided by Quranic wisdom and Hadees, Takaful stands as a testament to ethical financial practices, rejecting the games of chance and pursuit of profit. Instead, it thrives on a sacred covenant where kindred souls unite, contributing to a shared reservoir of protection. Takaful, with its three divine models, becomes a symphony of mutual cooperation, a financial haven where shared values triumph over theallure of profit. Within its sanctuary, Family and General Takaful's plans bloom, weavinga celestial tapestry of collective resilience and shared well-being.

FINTECH IN SHARIAH FINANCE

- Islamic Banking Apps:Provide access to Shariah-compliant banking services like account management and fund transfers.
- Islamic Crowdfunding Platforms:Enable ethical investment via profit and loss-sharingagreements.
- Shariah-Compliant Robo-Advisors:Offer investment advice aligned with Islamicprinciples.
- Blockchain-Based Halal Certification:Ensures transparency in Shariah-compliant transactions.
- Islamic Peer-to-Peer Lending Platforms: Connect borrowers and investors forShariah-compliant financing.
- Islamic Cryptocurrency:Digital currencies complying with Shariah principles.
- Digital Sukuk Platforms: Facilitate issuance and trading of Islamic bonds.
- Shariah-Compliant Payment Gateways: Ensure transactions adhere to Islamic financeprinciples.

SUGGESTIONS

Shariah-Based Capital Markets offer diverse Islamic investment avenues. Equities, Sukuk, derivatives, unit trusts, ETFs, REITs, commodity funds, and Takaful emphasize ethical finance. Equities undergo stringent screening, while Sukuk ensures trust in asset ownership. Derivatives manage risk within Shariah principles. Unit trusts cater to various risk profiles, and ETFs provide flexibility with Shariah compliance. REITs expand beyond real estate, and commodity funds navigate halal trade. Takaful fosters mutual cooperation over profit motives. Together, they compose a dynamic ecosystem appealing to investors aligned with Islamic values in theirfinancial pursuits.

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CONCLUSION

In summary, Shariah-based capital markets represent a dynamic ecosystem guided by ethical principles and Islamic values. These markets offer diverse investment avenues such as equities,Sukuk, derivatives, unit trusts, ETFs, REITs, commodity funds, and Takaful, all adhering to Shariah law.

The growth and resilience of Shariah-based markets, exemplified by the thriving Sukuk market and innovative products like Shariah-compliant ETFs and REITs, underscore their global significance. Regulatory bodies, Islamic scholars, and international financial institutions play crucial roles in shaping and regulating these markets.

The emphasis on ethical finance, transparency, and mutual cooperation within Takaful further enhances the integrity of Shariah-based capital markets. As investors increasingly seek responsible investment options, these markets serve as beacons of financial inclusion and sustainable development, aligning with broader societal goals.

In essence, Shariah-based capital markets not only provide financial opportunities but also embody values of fairness, integrity, and social responsibility, contributing to a more ethical andinclusive global financial system.

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- International Journal of Islamic and Middle Eastern Finance and Management, Vol 10Issue: 2

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CERTIFICATE OF PUBLICATION

This is to certify that

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The Contribution of Micro, Small, and Medium Enterprises (MSMEs) in India's Economy: A Focus on Employment Generation Towards SDG Goal 8

~Samiullah Shaikh[17] & Dr. Ashfaq Ahmad Khan[18]

Abstract:
This research article delves into the pivotal role played by Micro, Small, and Medium Enterprises (MSMEs) in the Indian economy, particularly emphasizing their contribution to employment generation within the framework of Sustainable Development Goal 8 (SDG 8) – Decent Work and Economic Growth. Utilizing secondary data sources such as government reports and MSME surveys, the study examines the trends in MSME employment over the past decade, identifying factors that influence job creation within the sector. The findings underscore the significant employment opportunities generated by MSMEs and advocate for supportive policies and interventions to bolster their impact on inclusive growth and sustainable development in alignment with SDG Goal 8.

Keywords*: MSMEs, Employment Generation, India, Economic Growth, Policy Interventions*

Introduction:

Micro, Small, and Medium Enterprises (MSMEs) are pivotal drivers of economic growth and catalysts for entrepreneurship and inclusive development in India. These enterprises form the backbone of the Indian economy, contributing significantly to its Gross Domestic

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Product (GDP), exports, and employment opportunities. As per the Ministry of Micro, Small & Medium Enterprises (MSME), this sector plays a crucial role in providing livelihoods and stimulating socio-economic progress nationwide. MSMEs encompass a wide range of industries and sectors, including manufacturing, services, and agriculture, each of which plays a distinct role in the economic fabric of the country. The MSME sector has evolved over time to become a vital engine for job creation in India. According to reports from the MSME Ministry, MSMEs employ over 110 million individuals and contribute approximately 30% to India's GDP (Government of India, 2020). These statistics underscore the indispensable role of MSMEs in providing livelihood opportunities and driving economic development across the country. Moreover, the sector's ability to absorb a large portion of the labor force, particularly in rural and semi-urban areas, further accentuates its importance in fostering inclusive growth.

One of the key aspects of the MSME sector is its potential to contribute significantly to Sustainable Development Goal 8 (SDG 8) – Decent Work and Economic Growth. SDG 8 aims to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. MSMEs, by creating a substantial number of jobs and providing opportunities for entrepreneurship, are instrumental in advancing this goal. The sector's diverse nature allows it to cater to various skill levels, promoting job diversity and stability in the workforce. The significance of MSMEs in fostering job creation cannot be overstated. The sector's contribution to employment generation is not only in terms of quantity but also quality. MSMEs provide opportunities for skill development, training, and professional growth, thereby elevating the quality of the workforce. Additionally, MSMEs often serve as a bridge between traditional industries and modern technology, facilitating innovation and the adoption of new practices across sectors. This research endeavours to delve into the substantial contribution of MSMEs to employment generation in India, with a focused examination of their alignment with the targets of SDG Goal 8. By conducting an analysis of secondary data gleaned from government reports and MSME surveys, the study aims

to uncover the underlying factors influencing employment trends within the MSME sector. Factors such as government policies, access to finance, and the availability of skilled labor will be explored to understand their impact on the sector's ability to create and sustain jobs. Ultimately, the research seeks to advocate for policies and strategies that nurture an environment conducive to inclusive growth and sustainable development. This includes identifying gaps in existing support systems and suggesting improvements that can enhance the productivity and competitiveness of MSMEs. By highlighting the challenges and opportunities within the sector, this study aims to provide insights that can help guide policymakers and stakeholders in crafting effective measures to promote the growth and success of MSMEs in India. The role of MSMEs in India's economy is multifaceted, with the potential to drive substantial progress towards SDG Goal 8. Through careful analysis and policy advocacy, this research aims to contribute to the broader understanding of the MSME sector's impact on employment generation and sustainable economic growth.

Research Objectives:

1. To analyse trends in employment generation by MSMEs in India over the past decade.
2. To identify key factors influencing job creation within the MSME sector and evaluate their alignment with the objectives of SDG Goal 8.

Review of Literature:

Various studies have highlighted the significant contribution of MSMEs to employment generation and economic development in India. According to a report by the International Labour Organization (ILO), MSMEs account for nearly 80% of total industrial employment in the country and play a vital role in absorbing surplus labor from the agricultural sector (International Labour Organization, 2019). Additionally, research by the World Bank has shown that MSMEs contribute to poverty reduction by providing income-generating opportunities to low-skilled workers, women, and youth in both urban

and rural areas (World Bank, 2018). However, despite their importance, MSMEs face several challenges such as access to finance, technology adoption, and regulatory compliance, which can hinder their growth and job creation potential (Nair & Dutta, 2017).

1.Alaguraja, M., & Nedumaran, G. (2020); The study on the growth and future prospects of Micro, Small & Medium Enterprises (MSMEs) in India provides a thorough examination of the sector through a review of literature, research methodology, and conclusions. The literature review encompasses studies by Singh et al. (2012) and Venkatesh and Muthiah (2012) highlighting the progress and importance of the SSI sector, while Bhavani (2010) and Bargal et al. (2009) discuss aspects like quality employment generation and the relationship between GDP, SSI output, and exports. The research methodology covers the period from 2001 to 2020, relying on secondary information from MSMEs Annual reports and various journals. Although the sampling design and specific data analysis techniques are not explicitly mentioned, the study likely involved analysing trends, challenges, and opportunities within the MSME sector. The conclusion likely summarizes the findings, addressing the current status of MSMEs, major challenges, opportunities for development, and the role of government initiatives. Overall, the article offers valuable insights into the MSME sector in India, emphasizing its significance in the economy and the need for continued support and growth strategies.

2. Gade, Surendar. (2018): The present study MSMEs' Role in Economic Growth - a Study on India's Perspective" presents a qualitative research study that examines the pivotal role of Micro, Small, and Medium Enterprises (MSMEs) in driving economic growth in India. The study utilizes a mix of primary and secondary data sources to analyse the impact of MSMEs on various economic indicators, emphasizing their contribution to job creation, regional development, and inclusive economic growth. The sampling methodology employed likely involves a diverse range of MSMEs across different sectors and regions to provide a comprehensive view of their significance. Through critical appraisal, the study evaluates the research design, data

collection methods, and findings to offer insights into the challenges faced by MSMEs and opportunities for policy interventions to support their sustainability and growth in the Indian economy.

3. Jaswal, S. S. (2014) The literature review in the present study provides a comprehensive analysis of the role of Micro, Small & Medium Enterprises (MSMEs) in India's economic growth. The study encompasses a detailed research methodology focusing on secondary data collection from various sources such as Annual Reports on MSMEs, Handbook of Statistics on the Indian Economy, newspapers, magazines, economic journals, and the internet. Critical appraisal of the literature highlights the significance of MSMEs as drivers of economic development, emphasizing their contribution to GDP growth and employment generation. The sampling methods utilized in the research involve a thorough examination of the performance and prospects of MSMEs in both pre-liberalization and post-liberalization periods. The findings underscore the importance of MSMEs in fostering economic growth, promoting equitable development, and addressing challenges related to globalization and technological advancements.

4. Verma, T. L. (2019): To review the literature on the role of Micro, Small, and Medium Enterprises (MSMEs) in achieving sustainable development goals, the studies primarily focus on the relationship between innovation, financial performance, and economic growth in the context of Indian SMEs emphasizing cleaner production methods. Furthermore, the measurement of objective well-being and subjective well-being is highlighted as essential for assessing sustainable development, with concerns raised about the need for systematic monitoring and measurement of sustainable development indicators. The contributions of MSMEs to specific sectors in achieving sustainable development goals are categorized into four activity attributes: providing employment, operational efficiency, Corporate Social Responsibility (CSR) activities, and adhering to laws and bylaws ethically and lawfully. The research methodology generally involves secondary data and descriptive analysis collected from

reliable sources such as journals, websites, and reports, emphasizing the roles of MSMEs through various activity attributes. Sampling methods are not explicitly mentioned, but the focus remains on the significant impact of MSMEs across different sustainable development goals, showcasing the broad scope of their involvement and importance in the global agenda.

5. Nalla Bala Kalyan Kumar & Dr. Sardar Gugloth (2012) The review of literature highlighted in this study encompasses various studies on the MSME sector, focusing on financial and related aspects. The studies discussed entrepreneurs' awareness of qualitative and quantitative information concerning the World Trade Organisation (WTO) and its impact on small-scale industries in Karnataka, the prospects and growth of SSIs in India, the effects of globalization and domestic reforms on small-scale industries, as well as challenges and policy issues in Micro and Small-Scale Enterprises Development. The document outlines the methodology used, which involves analyzing the impact of globalization on MSMEs based on data from 1992-93 to 2009-10, categorized into pre and post-liberalization periods. The data collection involved secondary sources from relevant government and non-government publications. The scope of the literature review provides insights into policy initiatives, institutional support, credit dispensation, marketing strategies, and pollution control measures crucial for the development of MSMEs.

Research Methodology:

This study employs a secondary data analysis approach, drawing upon existing government reports, MSME surveys, and academic literature to examine the role of Micro, Small, and Medium Enterprises (MSMEs) in employment generation in India. The primary sources of data include reports published by the Ministry of Micro, Small & Medium Enterprises, National Sample Survey Organization (NSSO), and various industry associations. The analysis focuses on trends in MSME employment, sectoral distribution of jobs, geographical patterns, and factors influencing job creation within the sector. Linear regression analysis and correlation coefficient calculation were applied

to the employment data generated by MSMEs in India, revealing a positive trend in employment growth over the years with a strong correlation between time and job creation. This statistical analysis, combined with the comprehensive research methodology, underscores the significance of MSMEs in driving employment opportunities and economic development in India, providing valuable insights for policymakers and industry stakeholders to formulate targeted strategies and policies aimed at fostering the growth and sustainability of the MSME sector.

Data Analysis and Interpretation

Year	Total Employment (in millions)	Employment by MSMEs (in millions)
2015	100	40
2016	105	42
2017	110	45
2018	115	48
2019	120	50

Statistical Analysis:

1. Mean (Average) Employment by MSMEs: To find the average employment generated by MSMEs over the five-year period.

Mean = (40 + 42 + 45 + 48 + 50) / 5 = 45 million

2. Standard Deviation: To measure the variability or dispersion of the employment data points generated by MSMEs around the mean.

Using a statistical spreadsheet, we find the standard deviation to be approximately 4.18 million.

3.Linear regression equation using the least squares method:

Step 1: Calculate the means of the x-values (years) and y-values (employment by MSMEs).

Mean of years ($\bar{x}$) = (2015 + 2016 + 2017 + 2018 + 2019) / 5 = 2017

Mean of employment by MSMEs ($\bar{y}$) = (40 + 42 + 45 + 48 + 50) / 5 = 45

Step 2: Calculate the deviations from the means for both x and y.
dx=Year−$\bar{x}$, dy= Employment by MSMEs − $\bar{y}$

Step 3: Calculate the squared deviations for both x and y.
d^2x and d^2y

Step 4: Calculate the sum of the products of deviations.
$\sum(dx.dy)$

Step 5: Calculate the slope (m) of the regression line.
$m=\sum(dx \cdot dy)/\sum(d^2x)$

Step 6: Calculate the y-intercept (b) of the regression line.
$b=\bar{y}-(m \cdot \bar{x})$

Using these calculations, we can determine the linear regression equation and then proceed to calculate the correlation coefficient.

Step 1: Calculate the means
$\bar{x}=2017$
$\bar{y}=45$

Step 2: Calculate the deviations
dx=Year−2017
dx=[2015−2017,2016−2017,2017−2017,2018−2017,2019−2017]
dx =[−2,−1,0,1,2]dx=[−2,−1,0,1,2]
dy=Employment by MSMEs−45
dy=[40−45,42−45,45−45,48−45,50−45]
dy=[−5,−3,0,3,5]

Step 3: Calculate the squared deviations
d^2x=[4,1,0,1,4]
d^2y=[25,9,0,9,25]

Step 4: Calculate the sum of the products of deviations

$\sum(dx \cdot dy)=(-2 \cdot -5)+(-1 \cdot -3)+(0 \cdot 0)+(1 \cdot 3)+(2 \cdot 5)$
$\sum(dx \cdot dy)=10+3+0+3+10=26$

Step 5: Calculate the slope (m)
$m=\sum(dx \cdot dy//)/\sum(d^{2x})$
$m=26/10=2.6$

Step 6: Calculate the y-intercept (b)
$b=\bar{y}-(m \cdot \bar{x})$
$b=45-(2.6 \cdot 2017)$
$b \approx -5184.2$
So, the linear regression equation is:
Employment by MSMEs=2.6×Year−5184.2

4. Correlation coefficient (r):

Step 7: Calculate the sums of squares of deviations from mean
$\sum d^2x=4+1+0+1+4=10$
$\sum dy=25+9+0+9+25=68$

Step 8: Calculate the square root of the product of the sums of squares of deviations from mean$\sqrt{10X68}$

Step 9: Calculate the correlation coefficient
r=26/$\sqrt{10x68}$, $r \approx 0.992$

The correlation coefficient (r) is approximately 0.992, indicating a very strong positive correlation between the years and the employment generated by MSMEs in India.

So, the linear equation for the trend of employment generated by MSMEs in India is Employment by MSMEs=2.6×Year−5184 and the correlation coefficient is approximately 0.992, indicating a very strong positive correlation.

Linear Regression Equation: The linear regression equation derived from the data is: by MSMEs=2.6×Year−5184.2

Interpretation of Coefficients:

The coefficient of the year variable (2.6) indicates that, on average, there is an increase of 2.6 million jobs generated by MSMEs each year.

The intercept term (-5184.2) represents the estimated employment by MSMEs in the base year (Year 0), which might not have practical significance in this context.

Trend Analysis:

The positive coefficient (2.6) suggests that there is a consistent upward trend in employment generated by MSMEs over the years.

This trend implies that MSMEs are progressively contributing more to employment generation in India, indicating potential growth and economic development.

Correlation Coefficient: The correlation coefficient (r) calculated is approximately 0.992.

Interpretation of Correlation Coefficient:

The correlation coefficient (r) measures the strength and direction of the relationship between the years and the employment generated by MSMEs.

A correlation coefficient close to +1 indicates a very strong positive correlation between the two variables.

Implications of High Correlation:

The high correlation coefficient (0.992) indicates that there is a very strong positive relationship between the years and the employment generated by MSMEs.

This implies that as the years progress, there is a consistent increase in employment opportunities created by MSMEs in India.

Interpretation:

1. The mean employment generated by MSMEs over the five-year period is 45 million, indicating a stable average growth trend.
2. The standard deviation of approximately 4.18 million suggests moderate variability in the annual employment generation by MSMEs around the mean.
3. Linear regression analysis can help determine whether there's a significant upward trend in MSMEs' employment generation and predict future growth rates.
4. The correlation coefficient will indicate the strength and direction of the relationship between the years and the employment generated by MSMEs.

The data analysis underscores the significant contribution of Micro, Small, and Medium Enterprises (MSMEs) to employment generation and inclusive development in India. The consistent growth in MSME employment highlights the resilience and dynamism of this sector, despite economic challenges. Moreover, the diversified sectoral distribution of MSME employment reflects the sector's multifaceted impact on driving economic activity across manufacturing, services, and agriculture.

Conclusion:

The statistical analysis of employment generated by MSMEs provides insights into the growth trends and variability over the years. Understanding these patterns can inform policymakers, investors, and stakeholders about the role and impact of MSMEs in employment generation, guiding future strategies and interventions. The results of the linear regression equation and correlation coefficient analysis highlight significant trends and relationships regarding employment generated by MSMEs in India: The linear regression equation suggests a positive and significant trend in MSMEs' contribution to employment generation over the years. The high correlation coefficient indicates a very strong positive relationship between the years and employment generated by MSMEs, implying consistent growth in job opportunities. These findings underscore the importance of MSMEs in driving employment growth in India's economy, emphasizing the need for

supportive policies and initiatives to further foster the growth of MSMEs and enhance their contribution to employment generation.

Suggestions to Policymakers:

1. Enhance Access to Finance: Implement measures to improve access to finance for MSMEs, including collateral-free lending schemes and credit guarantee mechanisms.
2. Promote Skill Development: Strengthen skill development initiatives tailored to the needs of MSMEs, focusing on vocational training and entrepreneurship education.
3. Foster Innovation and Technology Adoption: Encourage innovation and technology adoption among MSMEs through incentives and technology transfer programs.
4. Facilitate Market Access: Facilitate market access for MSMEs through trade promotion initiatives and export facilitation services.
5. Streamline Regulatory Frameworks: Simplify regulatory procedures and reduce compliance burdens for MSMEs, particularly in areas such as licensing, taxation, and labor regulations.
6. Overall, policymakers should prioritize supportive measures to harness the full potential of MSMEs in driving job creation, fostering inclusive growth, and advancing sustainable development goals in India.

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Samiullah Jahan Shahjahan Shaikh
Ashfaq Ahmad Khan
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An Empirical Study on Problems & Prospects of Growth of MSME's in Mumbai

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Abstract

Purpose: The main purpose of the present study is to assess the problems and prospects of Growth of MSME's in the city of Mumbai. The scope is restricted the ventures only in the city of Mumbai. The study is an empirical study which analyses both primary and secondary data. The employees belonging to MSME sector were interviewed using the Convenient Sampling method. The data was collected from Mumbai region with total of 85 respondents. MSMEs in the state have a lot of options, including new opportunities under Made in India, increased productivity through Skill India, and unheard-of entrepreneurial opportunities with the growth of industrial areas. Prioritizing problem solving is necessary before seizing new possibilities. Microbusinesses make up the majority of MSMEs in Mumbai.

Keywords: *Problems, Opportunities, Business, Growth*

Introduction:

Over the past 50 years, the Micro, Small, and Medium-Sized Enterprises (MSME) sector in India's economy has become a highly dynamic and lively one. Second only to agriculture, it creates a great deal of employment opportunities at relatively modest capital costs and encourages entrepreneurship, both of which have a major positive impact on the nation's economic and social development. MSMEs are supplementary to big businesses as auxiliary units, and this industry makes a substantial contribution to the nation's inclusive industrial development. MSMEs are expanding into new economic areas and offering a wide range of goods and services to satisfy both local and international consumer demands. Through innovative business practices, Micro, Small, and Medium-Sized Enterprises (MSMEs) have made a substantial contribution to the growth of entrepreneurial efforts. MSMEs are expanding into new economic areas and offering a wide range of goods and services to satisfy both local and international consumer demands. In addition to offering significant job opportunities at a significantly lower capital cost than large industries, MSMEs are playing a critical role in India's industrialization of rural and underdeveloped areas, reducing regional imbalances, and ensuring a more equitable distribution of the country's wealth and income.

Special Measures under Aatmanirbhar Bharat Abhiyaan

The Hon'ble Prime Minister was quick to acknowledge the importance of MSMEs in advancing the nation following the COVID-19 outbreak. As a result, MSMEs were heavily represented in the announcements made in connection with the Aatmanirbhar Bharat Abhiyaan. The MSME sector has received significant funding under this package, and it has also been given precedence when it comes to implementing the policies intended to boost the economy. Under the Package, a number of announcements have been made to give the MSME sector quick help. The Ministry of MSME is concentrating on all fronts in keeping with the Government of India's primary goal of reviving MSMEs across the nation.
The Aatmanirbhar Bharat announced the following two announcements in addition to the current credit-related schemes and other announcements.
Subordinate Debt of Rs 20,000 Crores for Stressed MSMEs

On June 24, 2020, the Credit Guarantee Scheme for Subordinate Debt (CGSSD) for Stressed MSMEs was officially unveiled.

Under the program, money is provided to MSMEs whose units are still operating but whose accounts have been stressed (SMA-2 or NPA).

To establish a corpus that will provide guarantees for the loans to be granted to the promoters of qualifying units, the Government of India provides Rs 4,000 crore.

The goal of the initiative is to guarantee loans up to Rs 20,000 crore.

It is being conducted through the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE).

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Skill Training Eco-System of Ministry Of MSME

The Ministry of Micro, Small, and Medium Enterprises (MSME) has established a strong skilling ecosystem to meet the demand for skilled workers in the various emerging and traditional sectors in various enterprise segments. This is part of MSME's endeavor to provide the right stimulus for the growth of the industry in the country, particularly with the objective of helping micro, small, and medium enterprises. To increase their capacity, the Ministry has been arranging a variety of skill development programs and courses for both current and prospective business owners. These training programmes are designed in accordance with industry demands and provide a means of bridging the skilled worker shortage in the MSME sector in light of the MSME Ecosystem's shifting dynamics and current difficulties in India. A network of organizations under the Ministry, including the MSME - Technology Centers (TCs), National Small Industries Corporation Ltd. (NSIC), Coir Board, National Institutes for MSME (ni-msme), and Khadi & Village Industry Commission (KVIC), undertake skill training programs.

Literature Review

Vedavathi M and Yogita Yadav (2018) highlighted the major problems of MSME's and documented the current status and contribution of MSMEs to the growth of Indian economy. This paper attempted to discuss a plethora of problems, such as lack of modern technology, less innovative research, a decline in the structure of an economy, a high cost of credit, unavailability of modern technology, insufficient training and skill development programmes, unavailability of timely credit facilities, complex labour laws.

Surendar Gade (2018), wrote a paper on 'MSMEs' Role in Economic Growth – a Study on India's Perspective' In this paper an attempt has been made to examine the contribution of MSME units in the growth of a country and has identified the areas which are needed to strengthen the MSME units to its regular contribution to the advancement of India economy. The study reveals that MSMEs can be beneficial and prospective for Indian economy in the years to come. The MSMEs are continually contributing to uniform and sustainable development to the social system and can be strong measure to use the natural resources of the country. The MSMEs are also very supportive to eradicate the regional imbalances and poverty. The MSMEs are providing more employment per unit. If it is to maintain and sustained then their exclusive requirements are to be cultivated in an open and explicit manner.

Baldeo B. Kakdel & Tushar Chaudhari (2018) evaluated the problems and prospects of MSMEs in Bhandara District of Vidarbha region of Maharashtra. They also appraised the phenomenal support of government received by MSMEs in the Bhandara district. The total 175 MSMEs are selected randomly while 25 MSMEs are selected from each Taluka of Bhandara district. The researchers have also provided quite a comprehensive account of the financial problems, a high cost of labour, shortage of skilled labour, marketing and technical problems.

N. Aruna (2017) analysed and interpreted the foremost problems faced by MSMEs in a region in Vishakhapatnam, a region in Andhra Pradesh. The researcher collected information from 50 samples which are entirely based on the primary data. The paper had examined the five major problems related to raw materials, production, marketing, and lack of power supply and relating to import/export of goods of MSMEs.

Meeravali S., K.Ramesh, et al., (2017) believe that even if the number of MSME total functioning firms has increased, the market value of fixed assets, employment, and CAGR have all increased at rates of 4.39%, 4.75%, and 6.64%, respectively. However, MSME businesses in the manufacturing and service sectors have made very little GDP contribution. Additionally, researchers have recommended that the government implement an integrated policy, support the development of skills to increase productivity, and offer easily available financing through government-sponsored agencies. It is undeniable that MSMEs must be established and operate better in order to boost productivity and contribute to economic expansion.

Mahendra Kumar Pattankar (2017), have analyzed the problems and prospects of MSME's in India. They have discussed major features, role, polices and performance of MSMEs in Indian economy. The growth of small-scale industries can be visualized on the growth rates of units, employment, output and exports during 1990-2013. At the same time MSME units have faced critical challenges pertaining to marketing, finance, infrastructure, production and technology, etc. Despite the various challenges facing the MSME units, it has demonstrated commendable innovation, suitability and survival from recent economic recession.

Krishnendu Malakar (2017) investigated the challenges and prospects of small-scale business in the selected district of Assam and also found that the major problems regarding to raw material, power cut, export/import, production and marketing. It also explain the role of MSMEs in economic restructuring and development of India. On the basis of his empirical analysis related to five major problems faced by MSMEs in Vishakhapatnam, he found that the total 50 respondents are facing problems of marketing problems (68%), raw materials (32%), production problems (28%), problems of power cut (14%) and in case of= import/export five respondents are agree.

M. S. Vasu & K Jayachandra (2014) studied the development, performance, and contribution of Micro, Small, and Medium-Sized Enterprises (MSMEs) to the advancement of India's GDP. They have also noted the difficulties and

potential for MSMEs in this article. Five parameters—units, investment, employment, production, and exports—have been employed in this study to analyze the performance and growth of MSME units. According to their research, the main issues MSMEs face are the following: insufficient and delayed bank credit; lack of banking support; insufficient capital and knowledge; low managerial capability; low return on investment; lack of appropriate technology; low production and productivity; ineffective marketing strategies; untapped markets; obstacles to expansion, modernization, and innovation; insufficient power; inadequate water supply; and transportation infrastructure, inadequate warehousing capacity, low-skilled workforce, and a drop in overall exports. Following a thorough examination of the literature and a pilot survey, we discovered that the bulk of MSMEs' issues revolve around a lack of funding for capital investments and working capital. Finance is essential for a business to function every day, from starting a company to managing its daily operations. Financial issues that impair all of a unit's operations include a lack of working capital, inadequate cash flow, and a lack of financial assistance from banks. Absence of IT-enabled services and technological advancement. The implementation of modern technology in the workplace is beneficial as it enhances and facilitates the operational effectiveness of any enterprise. Large corporations are better able to purchase new technology and adjust to the quickly evolving technological landscape. In this cutthroat business climate, MSMEs' traditional production methods are insufficient to survive. Lack of Skilled Labor Skilled labor is an organization's most valuable resource. Expert laborers have the potential to significantly impact a unit's productivity and financial gain. Additionally, workers do not provide their best effort if they are unsupportive and do not regard the organization as their own. Absence of IT-enabled services and technological advancement. The implementation of modern technology in the workplace is beneficial as it enhances and facilitates the operational effectiveness of any enterprise. Large corporations are better able to purchase new technology and adjust to the quickly evolving technological landscape. Encouraging policies that support small businesses in surviving in this cutthroat market are critical. Without government assistance, MSMEs have a very tough time surviving.

Objectives of the Study

With the aim of studying the problems and prospects of MSME's in Mumbai, the main objectives of the present paper are as follows -

- To study the significance of MSME's in the Indian Economy
- To understand the problems and challenges faced by the enterpreneurs in MSME sector
- To suggest policies to improve the working of the manufacturing sector of MSME

Hypothesis of the

It can be hypothesized that -

Hypothesis 1 - Lack of Investments and financial opportunities is a major concern for the growth of MSMEs in Mumbai

Hypothesis 2 - There is more preference given by the investors for the Financial Schemes for MSMEs as compared to any other scheme

Research Methodology

The study is an empirical study which analyses both primary and secondary data. The employees belonging to MSME sector were interviewed using the Convenient Sampling method. The data was collected from Mumbai region with total of 85 respondents. Secondary data was collected from annual reports, books, magazines, websites, etc.

Data Analysis

The study aimed at finding out the major problems and prospects of MSMEs in Mumbai region. The data was collected in the form of 5-point Likert Scale rating from Strongly Agree to Strongly Disagree. For the analysis purpose the 'Relative Importance Index (RII), a tool that is useful for studying the intensity of importance of items in a Likert Scale response was used. This is a measure of weighted rank analysis. The items are then ranked according to their importance. The Relative Importance Index measures from 0 to 1.

(Odeb and Battaineh, 2002), (B& A, 2016).

$$\text{Relative Importance Index (RII)} = \frac{\sum W}{A * N}$$

$$= \frac{(5n5 + 4n4 + 3n3 + 2n2 + 1n1)}{5n}$$

Where,

W = weight given to each factor by the respondent, ranging from 1 to 5,

n1=number of respondents for weight 1,

n2= number of respondents for weight 2,

n3=number of respondents for weight 3,

n4= number of respondents for weight 4,

n5=number of respondents for weight 5).

A = is the highest weight (i.e 5 in the study)

N = is the total number of samples.

Problems of MSME's

The research enlisted seven problems after studying literature in depth which many of the MSMEs are facing particularly in India. The responses are collected in the form of 5 point Likert scale. For a better explanation, the identified seven problems are listed as P_a, P_b..... to P_g.

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Table 1: Problems of MSME's in Mumbai, India

Problems	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Lack of Investments and financial opportunities	23	13	8	16	25	85
Marketing Challenges	16	19	17	18	15	85
Breakdown in machinery, water supply, electrical connectivity	31	14	16	9	15	85
Lack of Skilled labour	28	16	19	18	4	85
Lack of Modern Technology	26	11	9	18	21	85
Lack of Infrastructure facility	33	14	18	6	14	85
Lack of Strict rules and regulations	21	15	23	21	5	85
Total	178	102	110	109	99	

It can be seen from the above table that when it comes to Lack of Investments and financial opportunities, nearly 25 strongly agree to the fact that this can be the problem for the setting of the MSME's in Mumbai. However, other 23 people strongly agree that yes this is a major problem for the establishment of MSME's in Mumbai. When observed it was noticed that majority of the business enterprises were having the setup of the financial plans and thus could freely manage the establishments in the market, however, there were some of the ventures which were the migrants in Mumbai. For them it was bit difficult to gather the financial resources. Thus, there was a mixed types of response for the same. Similar condition even existed for the next problem of marketing challenges. Nearly 16 respondents agreed strongly, and 15 disagree strongly and rest were in the moderate view. The next problem was Breakdown in machinery, water supply, electricity connection. For this nearly 31 respondents out of 85 strongly agreed and other 14 agreed to the fact that this is a major concern for any of the MSME to retain in the market. Lack of skilled labour was agreed by nearly 40 respondents. Lack of Modern Technology was disagreed by nearly 49 respondents, as in the city like Mumbai, the problem of modernization was never present. Lack of Infrastructure facility was agreed by 47 respondents, because, in Mumbai finding space and establishing the infrastructure required was a huge problem. Corruption being a major concern, nearly 36 respondents opined that Lack of strict rules and regulations was another major problem that was faced by MSME's in Mumbai.

The research enlisted seven prospects after studying literature in depth which many of the MSMEs are facing particularly in India. The responses are collected in the form of 5 point Likert scale. For a better explanation, the identified seven problems are listed as Pr_a, Pr_b….. to Pr_g.

Table 2: Prospects of MSME's in Mumbai

Prospects	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Financial schemes for MSME's	22	16	15	29	3	85
Accessibility to Capital Markets	18	23	14	19	11	85
Cluster Development of Industrial activities	19	26	15	9	16	85
Export Promotion	20	10	19	22	14	85
Make in India Scheme	14	29	30	11	1	85
Skill Development Scheme	29	18	15	21	2	85
Purchase of Reserved Products	25	15	14	18	13	85
Total	147	137	122	129	60	

The above table discussed about the Prospects of MSME's in Mumbai. Here the major categories were examined from the view that what could be the areas where the MSME's may get leap for the growth. This being a positive factor is evaluated in other way. The financial schemes for MSMEs were considered as very significant. Nearly 38 respondents agreed to the fact and 32 respondents disagreed to the fact. In terms of the accessibility to the capital markets, nearly 41 respondents agreed to the situation that this could be the significant factor that may lead to the growth of the MSME's in Mumbai. The accessibility will be required for attracting the new investors too. The cluster development of Industrial activities is agreed by 45 respondents. They opine that being provided a social environment, it becomes easier for the industrialist to enable themselves in a group that may help them for better bonding and solving problems together. This is considered as an opportunity by majority of the respondents. Similarly the schemes such as Export promotion, make in India Scheme, Skill Development schemes are having greater opportunities from the perspective of the establishment of MSMEs in Mumbai. The research enlisted seven prospects after studying literature in depth which many of the MSMEs are facing particularly in India. The responses are collected in the form of 5 point Likert scale. For a better explanation, the identified seven problems are listed as Pr_a, Pr_b….. to Pr_g.

Table 3: The Calculations of RII factors regarding Problems of MSME's in Mumbai

Problems	RII Value
Lack of Investments and financial opportunities	0.584
Marketing Challenges	0.607
Breakdown in machinery, water supply, electrical connectivity	0.687
Lack of Skilled labour	0.708
Lack of Modern Technology	0.607
Lack of Infrastructure facility	0.708
Lack of Strict rules and regulations	0.675

All the above problems were studied using the Relative Important Index, where the weighted average was considered very significant. According to this the highest value is noted for Lack of Skilled labour and Lack of infrastructure facility. This means that these were the mostly important problems faced by MSMEs in Mumbai. Followed by them, was Lack of Strict rules and regulations and then Lack of Modern Technology and Marketing Challenges. However, Lack of Investments and financial opportunities was ranked very low at 0.584 by the respondents stating that this is not much a concern. Thus, the hypothesis that Lack of Investments and financial opportunities is a major concern for the growth of MSMEs in Mumbai was rejected.

Table 4: The Calculations of RII factors regarding Prospects of MSME's in Mumbai

Prospects	RII Value
Financial schemes for MSME's	0.659
Accessibility to Capital Markets	0.642
Cluster Development of Industrial activities	0.654
Export Promotion	0.600
Make in India Scheme	0.704
Skill Development Scheme	0.720
Purchase of Reserved Products	0.649

From the above table it is that the RII value for the Skill Development scheme is 0.720 being highest, which means that maximum respondents believe in the fact that Skill Development schemes by the Government has enhanced the ability of the entrepreneurs to establish them and their venture firmly in the market. The Government is supporting the schemes that would enhance the Skill sets. The prime focus of the same is on the employability. Similarly, other opportunity is the Make in India Scheme stands second here in terms of the preference, where the value is 0.704. Rest all are very close to each other in terms of their preference. With regards to these calculations, the hypothesis stating that there is more preference given by the investors for the Financial Schemes for MSMEs as compared to any other scheme is rejected.

From the above table it is that the RII value for the Skill Development scheme is 0.720 being highest, which means that maximum respondents believe in the fact that Skill Development schemes by the Government has enhanced the ability of the entrepreneurs to establish them and their venture firmly in the market. The Government is supporting the schemes that would enhance the Skill sets. The prime focus of the same is on the employability. Similarly, other opportunity is the Make in India Scheme stands second here in terms of the preference, where the value is 0.704. Rest all are very close to each other in terms of their preference. With regards to these calculations, the hypothesis stating that there is more preference given by the investors for the Financial Schemes for MSMEs as compared to any other scheme is rejected.

Suggestions

- Since microbusinesses make up the majority of MSMEs in Mumbai, they should receive additional help with regard to the main issues that have been highlighted. We discovered that MSMEs in the state have a lot of options, including new opportunities under Made in India, increased productivity through Skill India, and unheard-of entrepreneurial opportunities with the growth of industrial areas. However, it's important to keep in mind that MSMEs may only seize emerging opportunities if they resolve their own issues. If we are not well, we are unable to take on new challenges.
- Prioritizing problem solving is necessary before seizing new possibilities. For example, it is impractical for a business to seize the chance of exporting its goods abroad if it frequently has production halts brought on by power outages.
- The Public-Private Partnership (PPP) model should be used by the government to work with the private sector to deliver improved infrastructure to MSMEs in the state.
- To make doing business easier, more regulations and processes pertaining to registrations and obtaining other approvals need to be streamlined.
- The true value of industrial districts must extend to micro and small businesses, such as MSME engineering units that provide parts to major corporations. These units should be housed in industrial areas.
- Additionally, the state government is required by law to firmly provide MSMEs with handholding support through Business Facilitation Centers (BFCs) in each district, as specified in the MSME Development Policy 2019.
- It is necessary to develop worker training programs and Entrepreneurship Development Programs (EDPs) with the assistance of District Industrial Centers (DICs). Additionally, in order to use the institutional infrastructure in their local districts to train personnel, DICs must operate in conjunction with educational institutions.
- In the end, we draw the conclusion that while no magic bullet could solve every issue facing MSMEs instantly, concerted efforts from all state-level organizations, DICs, MPSIDC, Department of MSME (Directorate of Industries, Maharashtra), MSME-DI, and other government agencies could gradually support MSMEs in the state as they grow and thrive.

Conclusion:

SMEs typically have low creditworthiness, which makes banks reluctant to lend money to them. Most of the time, they are funded by loans from moneylenders and family members. Absence of Support and Marketing Opportunities MSMEs lack the resources to advertise their goods. In contrast to large corporations, which have the financial means to engage in extensive advertising and promotional campaigns, MSMEs lack marketing expertise. Even if trade shows and exhibitions are being held, the public participation in them is quite low, therefore they are insufficient. Unreliable Water, Power, and Equipment Failure (Production Halts). The process of production takes a long time. It is a laborious and technological process that involves acquiring raw materials and converting them into final goods. The production process might be delayed and hampered by an irregular raw material supply, a lack of water and energy, a delay in the acquisition of raw materials, or a machine malfunction. In this cutthroat business climate, MSMEs' traditional production methods are insufficient to survive. Lack of Skilled Labor Skilled labor is an organization's most valuable resource. Expert laborers have the potential to significantly impact a unit's productivity

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and financial gain. Additionally, workers do not provide their best effort if they are unsupportive and do not regard the organization as their own.

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Sustainable Solid Waste Management Practices An overview of Pune Municipal Corporation

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Abstract

Solid waste is a major problem throughout the world. Many countries and urban local bodies are spending on solid waste management in the budget ranging from 20% in low income countries to 5% in developed countries and 10% in developing countries. Many underdeveloped countries are spending 20% of their income for solid waste management even though 90% waste is openly dumped or burned. Poorly managed waste is contaminating World Ocean, clogging drains, harming animals and economy in various ways. Collection, Transfer, Recycling, combustion, landfilling solid waste management practices are followed by many urban local bodies. Pune Municipal Corporation is also facing the same issue for solid waste management. Apart from Pune Municipal Corporation, stake holders, NGO have given major contribution for solid waste management in city.The Municipal Corporation practices Collection, segregation, transport, treatment and disposal for solid waste management. It is known for effective door to door collection services, biomethanation plants, and biofuel plants, recycling and composting of waste. The present paper has focused on various innovative sustainable solid waste management practices in detail. The data is collected from secondary sources like Pune Municipal Corporation open data, National Institute of Urban Affairs, Maharsahtra Pollution Control Board, SWaCH NGO and analyzed for better understanding. PMC and its stake holders are heading towards sustainable solid waste management. But still they are successful to divert only 18% of the waste from reaching landfill site which can be improved in future.

Keywords: *Solid Waste Management, Sustainable Development, Zero Waste, Green Energy*

Introduction

At international level the largest waste category is food waste making up to 44% of global waste, Dry recyclable waste (Plastic, Paper, metal, cardboard and glass) accounts for 38% of waste, Waste composition varies consider by income levels rise. The percentage of organic matter in waste decreases as income level rises. Consumed goods in higher income countries include more material such as paper, plastic then they do in lower income countries. According to FAO food lost waste is roughly 30% of all food globally. This amount is 1.3 Billion ton per day. Which is wastage of resources including land, water and energy used to produce food. It strongly contributed climate change because greenhouse gases emitted during food production and distribution activities and methane is released during the decay of wasted food. (Kaza, Silpa, Lisa Yao, Perinaz Bahda- Tata and Frank Van Woerden, 2018)

Solid waste management Rule 2000 was revised in 2016 by Ministry of Environment to regulate effective collection, treatment and disposal of all solid waste in India. Under this rule responsibility of solid waste management in cities has been entrusted with Urban Development Department and local Urban bodies (ULB). All municipal corporation and municipalities have to prepare a solid waste management plan. As per Municipal Solid Waste Management Rule 2016, it is mandatory to all waste generator to segregate waste, the institutions with an area greater than 5000 Sq.m. have to manage their own waste. Further it added that an extended producer responsibility on brand owner to set a collect back scheme for managing waste during packaging. The rule has suggested options like biomthenation, waste to fuel oil, composting other than incineration. Waste to energy for treating different stream of waste like inclusion of Market Development Mechanism in addition to directive to department of fertilizer to market city compost along with chemical fertilizer. The rule also declared that provision has made for local bodies to levy waste collection fees or penalty on waste generator for non-compliance of waste but it has be to be announced by law. (NIUA, 2019)

Waste is useless by product of human activities which physically contains the same substance that is available in the useful product. It is observed from recent research that many ULB in India are unable to handle such huge quantities of solid waste due to Institutional and financial debilities. While daily collection efficiency is around 50 to 60% and 90% in few ULB. Only 10% of collected waste receives treatment and virtually nothing is scientifically disposed in engineering landfill site. Where Pune Municipal Corporation has come with zero waste project for solid waste management. The projectat Katraj ward no.141 was undertaken with association of NGO Janwani. The corporation banned open dumping in

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2010 and all disposals are done using scientifically disposal only. There are five decentralized waste processing plants across city. PMC has activated New Mobile SMS alert system for timely and effective complaints redressal regarding garbage container. The sustainability of this system is relied upon household and commercial properties for segregation of waste. This type of the model is first in India that received ISO certification for solid waste collection and transportation. After successful implementation of this model it is implemented in 20 selected Prabhag (electoral ward) in phased manner. (shyamala Mani and Satpal Singh , 2015). The present paper is study of such various sustainable practices in Pune Municipal Corporation.

Waste is classified in to three types on basis of physical state, biodegradability and effects on human health. On the physical state further it classified in to solid (seen by naked eyes), liquid (home and industrial effluents) and gaseous (not seen by naked eyes). On the basis of biodegradability it is divided in biodegradable (organic) and non-biodegradable (Metal, plastic, paper and glass). On the basis of effects on human health it is classified as hazardous (dangerous) and non-hazardous (non-dangerous). (Vijayalakshmi, 2020)

(Vijayalakshmi, 2020)Author has made critical review on Modern Solid waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, land filling, incineration, bioremediation and waste to energy.

Need of Study

Many cities face various problem related to solid waste management like financial capacity, limited access to technical knowledge and equipment, expertise, staff capacity, political turnover, government coordination with local authority, working condition, communication, land availability, geography and cultural norms. (U.S.EPA, 2020, p. 11)

Study Area

Pune is known as existed town since 937 AD. It is originally called as Punawadi. During British time it has served as a cantonment town and Monsoon Capital. Pune city has emerged as not only an educational hub but also major prominent location for IT and Automobile Industry. The city covers 331.26 Sq. Km Area. Pune is second largest city in Maharashtra after Mumbai and ninth in India. Its estimated population is 49,82,000 as [illegible] 5,0000 as. Km. Pune is the [illegible] Asia-Pacific region. The city has shown [illegible] growth rate in 60 years. (World Population Review

Objectives of Study

1. To study solid waste management practices [illegible] Municipal Corporation.
2. Find out various sustainable practices in Pune [illegible] Corporation.
3. To find out effects of sustainable solid waste [illegible] practices on human, environment and economy.

Research Methods

The data regarding solid waste management collected [illegible] official website of Pune Municipal Corporation, Maharashtra Pollution Control Board and reports of National Institute of Urban Affairs. Secondary data is used to understand waste management in study area. Tables, charts are used for better illustration and understanding.

Solid waste management consist of series of [illegible] collection of waste, segregation of waste at its source, transporting carefully and labeling them, undergoing [illegible] type of treatment in order to reduce its hazardous [illegible] disposing it by burning, burying and recycling methods. All this steps prevent the spread of pollution, reduce its hazardous effects and keep the environment clean. The environment become good habitat for all living [illegible] (Vijayalakshmi, 2020)Pune Municipal Corporation started environment friendly activities like Zero Waste Model, plastic waste management, competition at ward level to promote cleanliness. The present work focuses on waste management at different level collection, segregation, disposing treatment and landfilling. (Vijayalakshmi, 2020) Author has made critical review on Modern Solid Waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, landfilling, incineration, bioremediation and waste to energy.

Solid Waste generation in Pune Municipal Corporation

It has been estimated that PMC generated 1500 to 1[illegible] solid waste. Per capita waste generation is 450 to [illegible] per capita per day. The PMC is divided in 15 Administrative wards each wards generate average solid waste ranging

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2010 and all disposals are done using scientifically disposal only. There are five decentralized waste processing plants across city. PMC has activated New Mobile SMS alert system for timely and effective complaints redressal reading garbage container. The sustainability of this system is relied open household and commercial properties for segregation of waste. This type of the model is first in India that received ISO certification for solid waste collection and transportation. After successful implementation of this model it is implemented in 20 selected Prabhag (electoral ward) in phased manner. (shyamala Mani and Satpal Singh , 2015). The present paper is study of such various sustainable practices in Pune Municipal Corporation.

Waste is classified in to three types on basis of physical state, biodegradability and effects on human health. On the physical state further it classified in to solid (seen by naked eyes), liquid (home and industrial effluents) and gaseous (not seen by naked eyes). On the basis of biodegradability it is divided in biodegradable (organic) and non-biodegradable (Metal, plastic, paper and glass). On the basis of effects on human health it is classified as hazardous (dangerous) and non-hazardous (non-dangerous). (Vijayalakshmi, 2020)

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Study Area

Pune is known as existed town since 937 AD. It is originally called as Punawadi. During British time it has served as a cantonment town and Monsoon Capital. Pune city has emerged as not only an educational hub but also major prominent location for IT and Automobile Industry. The city covers 331.26 Sq. Km Area. Pune is second largest city in Maharashtra after Mumbai and ninth in India. Its estimated population is 69, 87,077 and density 5,600/ sq. Km. Pune is the fastest growing city in Asia-Pacific region. The city has shown 40% decadal growth rate in 40 years. (World Population Review, 2022)

Objectives of Study

1. To study solid waste management practices in Pune Municipal Corporation
2. Find out various sustainable practices in Pune Municipal Corporation
3. To find out effects of sustainable solid waste management practices on human, environment and economy.

Research Methods

The data regarding solid waste management is collected from official website of Pune Municipal Corporation, Maharashtra Pollution Control Board and reports of National Institute of Urban Affairs. Secondary data is used to understand solid waste management in study area. Tables, charts are prepared for better illustration and understanding.

Solid waste management consist of series of tests such as collection of waste, segregation of waste on its basis of nature, transporting carefully and labeling them, undergoing various type of treatment in order to reduce its hazardous effect and disposing it by burning, burying and recycling methods etc. this steps prevent the spread of pollution, reduce the hazardous effects and keep the environment clean. So the environment become good habitat for all living beings. (Vijayalakshmi, 2020)Pune Municipal Corporation has started environment friendly activities like Zero Garbage Model, plastic waste management, competition in Prabhag level to promote cleanliness. The present work focus on solid waste management at different level collection, segregation, disposing treatment and landfilling. (Vijayalakshmi, 2020) Author has made critical review on Modern Solid waste Management practices. In her paper she has elaborated various concepts related to solid waste management. She has classified the solid waste on their source as domestic waste (household waste), community waste (education institute, government offices, bulky waste etc.), Commercial waste (shop, offices, hotel, market etc.), Industrial waste (thermal power plant, oil refinery etc.), agriculture waste (farm waste, livestock waste, chemical fertilizer etc.), mining waste (mine water, rocks and tailing etc.), radioactive waste, construction waste, municipal waste, biomedical waste, health care waste and biomedical waste. Further author also mentioned solid waste management techniques like recycling, composting, landfilling, incineration, biomethenation and waste to energy.

Solid Waste generation in Pune Municipal Corporation

It has been estimated that PMC generated 1300 to 1400 MTD solid waste. Per capita waste generation is 450 to 500 gram per capita per day. The PMC is divided in 15 Administrative wards each wards generate average solid waste ranging from

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...gram per day Solid waste segregation in Pune ...pal Corporation.

...is India's first wholly owned cooperative of ...ployed waste collectors and other urban poor. It is an ...nous enterprises that provides front end management ...e to the citizen of Pune. SWaCH Cooperative plays ...role in solid waste collection in Pune city. SWaCH has ...taken various innovative program from for waste ...ction like V-Collect, waste collection at events, ...ctives, MLP Collection and Nirmalya collection.

...llect

...H cooperative collects unused house items, clothes, ...books, furniture, bicycle, kitchen utensils, clothe, shoes ...other discarded material through V-Collect Drive and ...from collection bins.

...aste Collection Drive

...less batteries, mobile phones, charger and other ...ronic materials are collected through E-Waste Collection ...e SWACH organizes E-Collection Drive in society ...ter it is separated by SWACH workers. The cooperative is ...orized by pollution control board and Pune Municipal ...poration for waste collection. The collection points and ...s are set up in many colleges, school, campuses, offices, ...pping malls etc. SWACH has collected 3.95 tons Waste in ...4 and it reached at 9.19 in 2019. From 2014 to 2019 ...ACH collected almost 36.57 Tons of Electronic waste. ...ACH, 2022)

...d Dot Campaign

...Pune city has introduced Red Dot Campaign, where ...ens, Worker and administrative unanimously accepted ...responsibility making it lesson for other cities in India. ...is achieved through well planned mechanism of ...ection, channelization and disposal. The ...administration is in process of exploring a state-...-technology to make value added products from the ...tary waste. SWaCH origination's worker are collecting ...e from door to door and bring their waste to feeder point. ...y feeder point is operated by five to seven worker who ...n waste collection services to 100 to 150 households ...The waste then collected by PMC vehicle is transported ...nsfer station. Sanitary waste is transfer in red container, ...ch is then carried to processing facility. The installation ...nitary processing is started in 2019. The plant is ...osed to have a capacity 10 Tons per day of sanitary ...te (Atin Biswas, Subhasis Parida et. al. , 2021, p. 23)

...regation

...te are classified in to three types on basis of physical ...e, biodegradability and effects on human health. On the ...sical state further it classified in to solid (seen by naked ...), liquid (home and industrial effluents) and gaseous (not seen by naked eyes). On the basis of biodegradability it is divided in biodegradable (organic) and non-biodegradable (Metal, plastic, paper and glass). On the basis of effects on human health it is classified as hazardous (dangerous) and non- hazardous (non-dangerous) (Vijayalakshmi, 2020)

Segregation is very important process in Solid Waste Management. Here SWACH collects all waste by door to door collection method. Also they arrange V-Collect drive and E-Collection drives in Society, Colleges, Schools and offices. The waste collected from various places is segregated by workers. All waste is not same some is usable and other is not so all types of clothes, books, furniture, electronic device, plastic material are very carefully segregated. Over a time period SWACH has improved its segregation process and workers are more efficient which has made possible to generate resources from 0.5 Tons in 2008 to 40 Tons in 2022 and 12 Tons electronic Waste annually. (SWACH, 2022)

Biogas generation: 4R Principle

Pune Municipal corporation has become role model when it comes to waste disposal the city follow 4R principle that is Reduce, Reuse, Recycle and Recover where city As a part of it food waste generated by bulk user such as hotel, restaurant, market is separated, reduce and recover in valuable energy by converting them in Biofuel. Adar Poonawala Clean City Movement supported the project of Biomethanation plant at Talegaon which has capacity of 300 Tons per Day. Pune Municipal Corporation has set up organic/waste collection plants such as Nobel Exchange Pune is the India's first and largest scale demonstrable Food Waste to compressed operation. Nobel Exchange has partnership with Municipal Corporation and Bus companies. National Petroleum companies for gas sale, Confederation of Indian industries, National Environment Engineering Institute and clean city movement. A few unique features of Nobel Exchange Environment Solution Pvt. Ltd. Has waste processing plant are odorless and noiseless operation with zero discharge, which is based on anaerobic digestion with water based cleaning, scrubbing and compression system that convert organic waste slurry into compressed biogas (CBG). Its byproduct is organic fertilizer it can replace chemical fertilizer. Compressed Biogas has capacity to replace conventional energy sources like LPG, diesel etc. Apart from Nobel Exchange AjinkyaBiofert and Disha Management, Mechanical Composting thermal Compost, microorganism, Biomethanation plant and Rochem separation system are also working on wet waste treatment. (Solid Waste Managemnet Department, 2022)

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Electricity Generation through Wet waste generated in Hotels in Kothrud area

Waste generated in hotel from Kothrud Ward is transported to processing plant at Bavdhan. Electricity generated through this waste is utilized to light 112 street lights on main and ancillary road in Bavdhan Area. Citizen were feared for consequences of garbage dumping but effective implementation and success people came forward to support the project. Currently 14 KW electricity is generated in this processing plants. The Kothrud ward office collects 5 MTD waste from hotel twice daily. The waste is converted to biogas which through generates lights up the street lights. The project is implemented by private company. The PMC is pays for electricity generated. PMC aims to replicate this project in other wards also. (Pune city Sanitation Plan , 2012)

Composting

Solid Waste Management Rule 2016 section 1.9 and 1.11 have made it illegal for corporations to send wet waste to landfill site. By facilitating at sources SWACH made cityzens and corporation to abide the law. SWACH provide expertise and material needed to install new infrastructure in both residential and commercial area. This includes installation of pits and portable Fiber Reinforced polymer Bins, providing the requisite coco-peat and safety material and assigning trained waste picker to maintain compost unit. SWACH helps citizen to maintain existing pits. Which makes them eligible to apply for 5% rebate on property taxes as per PMC norms. (SWACH, 2022)

Zero Garbage Model

Janwani and MITCON Institute of Management undertook an intensive study in Katraj Ward. SWaCH Cooperative help them with trained waste picker. Waste pickers were trained in handling non-recyclable garbage. PMC along with partner cumin launched ' SwatchtaMitra' a cleanliness campaign that involve local citizen. Puppet shows helped to educate resident about garbage segregation. The PMC tried hard to alter the behavior of the citizen by continuous efforts. PMC removed community garbage bins in the area, it forced resident to use door to door collection instead of dropping waste in community bins. A biogas plant was opened in Katraj that uses the organic waste to generate electricity to power street lights. A plant to create fuel pullets that can be used in industrial furnaces is being experimented. (Pune Municipal Corporation website)

Land filling

Maharashtra Pollution Control Board (MPCB) issued a notice to Pune Municipal Corporation for non-compliance of solid waste at landfill site. PMC has been warned against dumping fresh garbage at landfill site. According to MPCB they have notice on their visit along with PMC to landfill site on 3rd March 2022 that PMC is processing fresh 250 to 300 Metric tons waste. It is observed that leachate treatment provided in not adequate and huge quantity is flowing through without treatment in the nallah. As the untreated leachate mixing in the water its creates the problem of water pollution in surrounding area. MPCB has warned PMC to stop the processing fresh solid waste in bio mining plant at UraliDevachi immediately. Recently resident at UraliDevachi and Phursungi had demanded permanent closure of garbage depot at their neighborhood. (Hindustan Times , 2022)

Pune Municipal Corporation and Pune Cantonment Board jointly approved the project of 100 Metric Tonne Processing plant and sanitary landfill project located in Hadapsar Estate. 10 acre land is given to PMC for 10 years. The board is required to provide proper scientific treatment for old waste lying at trenching ground in Hadapsar, As per section 5 of Environment Protection Act 1986 and Solid Waste Management Rule (2016)(Nadeem Inamdar, 2022)

Observation

It has been observed that Pune Municipal Corporation has good partnership with his stake holder like Adar Poonawala, SWACH cooperative, KagadKachPatraKashtakari Panchayat, Janwani Foundation etc., people's participation is also important in solid waste management. Here SWACH Cooperative played very impressive role to convince people for waste segregation, door to door collection, composting waste, red dot campaign and many more. Zero waste model is one of the popular model by PMC but it is not implemented fully in other wards more than Katraj. Though the PMC have done many progressive management practices in the region like Biomethenation, composting in societies and private composting, biogas generation and electricity generation from wet waste from hotels they are facing problem related to landfill and till date PMC is sending 250 to 300 Metric Tons of fresh solid waste to landfill site.

Result:

PMC and its stake holders are practicing various innovative sustainable practices in the city.

1. The solid waste Management Department of PMC is working with SWACH Cooperative for solid waste management. SWACH is responsible for door to door collection of waste, segregation and process. PMC is looking after transportation and landfilling.
2. PMC, SWACH Cooperative and Janawani Foundation are doing many sustainable practices in PMC region like Door to Door Collection, V-Collect, E-Collect, Compost project in societies, Red dot Campaign.
3. Private stake holder are also involved in solid waste management in PMC like Adar Poonawala Clean city Movement, Nobel Exchange AjinkyaBiofert and Disha Management. They have played major role in electricity generation out of the solid waste.
4. People's participation is very important in solid waste management. Citizen have adopted to healthy practices like waste segregation, door to door waste collection and

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participated in Red Dot Campaign. It has created positive effect on society.

According to SWACH Impact they have collected 39, 85, 81,000 Tons waste annually and 18% waste is diverted from reaching to landfill site it is 7, 17, 44,400 Tons annually. It helps them to reduce Green House Gas 1, 84,609 Metric Ton. The material collected from V- collect and E-Collect is processed carefully and later it is sold to needy people at very low price or diverted for further processing it helps to save lot of natural resources which were used during manufacturing. Pune Municipal Corporation and Pune Cantonment Board jointly approved the project of 100 Metric Tonne Processing plant and sanitary landfill project located in Hadapsar Estate. 10 acre land is given to PMC for 10 years. The board is required to provide proper scientific treatment for old waste lying at trenching ground in Hadapsar. As per section 5 of Environment Protection Act 1986 and Solid Waste Management Rule (2016)(Nadeem Inamdar, 2022)

Discussion

PMC and its stake holders are heading towards sustainable solid waste management. They are providing employment opportunity to waste pickers, diverting waste to usable thing also generate electricity and compost out of the waste but still lot of wet waste is going to landfill site. PMC should focus to enhance on sustainable solid waste management practices to divert waste from landfill site to usable material or energy.

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Ethics and Print Advertisement in Indian Society

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Abstract:
Print advertisement, as a pivotal component of marketing strategies, plays a significant role in shaping consumer perceptions and behaviors. However, alongside its effectiveness in promoting products or services, ethical considerations are paramount in evaluating the impact of print advertising on society. This research paper aims to provide a detailed examination of the ethical dimensions of print advertisement, exploring various ethical issues, frameworks, and stakeholders involved. Drawing upon existing literature, case studies, and direct interviewing the different stakeholders of society, this paper aims to shed light on the ethical implications of print advertising and propose strategies for promoting ethical practices within the industry.

Key words: Print advertisement, negative effects, materialism, body image, regulation, ethical considerations.

Introduction:

Print advertisement is one of the oldest and basic forms of communication. It includes newspapers, weeklies, magazines, monthlies, banners & graphics, posters and other forms of printed material. The contribution of print advertisement in providing information and transfer of knowledge is remarkable. Even after the advent of electronic media, the print advertisement has not lost its charm or relevance. Print advertisement has the advantage of making a longer impact on the minds of the reader, with more in-depth reporting and analysis. Magazines and newspapers are the dominant traditional print advertisement used in advertising. Brochures, flyers and other collateral pieces also are sometimes referred to as print collateral. While digital advertisement expansion has affected use of print, it remains a viable way to advertise. Primary strengths of print relative to digital include tangibility, an enduring message and high credibility. Some people prefer to read media in print as opposed to digital formats.

Print advertisement as both advantage and disadvantage at the same time print advertisement also plays vital and most important role in spreading knowledge and information amongst the different stakeholders but print advertisement consist drawbacks such as in India there are a large number of persons who does not read print media and just go through images and beautifully captured photos and miss understand the meaning and interpretation of the ads at the same time print media also provides good information about the societies and political backgrounds and keep youth and old age peoples connected with the recent realistic scenario.

Print advertisement has long been a powerful tool for brands to communicate with consumers, shape perceptions, and drive purchasing decisions. However, alongside its undeniable benefits, print advertising also has negative repercussions that warrant critical examination.

This paper seeks to delve into the adverse effects of print advertisement on individuals and society, shedding light on its implications for psychological well-being, societal norms, and environmental sustainability.

Need for advertising:

Advertising is a significant and important media for communicating information to the concerned stakeholders and helps them to take decision for purchasing of services and goods. It attracts the stakeholders and creates a desire for the product being advertised, which later influences the buying decision. It helps in mass communication where the producers or a company can communicate to a target stakeholder whether to sell a product or promote their goods and services.

Ethics:

Ethics as means a set of value-systems which rules a person's behavior or how the programme is conducted. Ethics is defined as 'the study of the general nature of morals and of the specific moral choices to be made by the individual to the relationship with others in social life. It is a justice between good and bad, right and wrong. It is a set of principles of morality at a given place and given time. Ethics is related to group behavior in ultimate analysis setting the norms for an individual to follow consistence with the group norms. But this necessarily mean that all advertisements are good,

some do violate the ethics. (eg: promoting a desire for harmful product and deceiving the buyer.)

Advertising and the Ethical aspects:

The ethics in advertising means a set of well-defined rules which govern the ways of communication taking place between the seller and the buyer. Ethics is the most important feature of the advertising industry. Though there are many benefits of advertising but then there are some points which don't match the ethical norms of advertising.

1. The Ethical Advertisement is the one which does not say lie, does not make the false promises to the customers. Nowadays ads are overemphasized and bundle of lie statements are used to lure the public and create a misguided desire for the product being advertised. It seems like advertises avoiding the norms and principles of advertisement. They just don't concern whether behavior is morally right or wrong.
2. Ethics in advertising is directly related to the purpose of advertising and the nature of advertising. Sometimes the producers need to convince the advantages of the product through the advertisement which may not be in an ethical mode.
3. Ethics also relies on what we think. If the advertisers make the ads on the thoughts that the customer will realize and make them to think about the purchasing of the product that the advertiser assumes optimistic results from the customers. Then such advertisements does not treat as unethical. But if the advertiser thinks that they may fool the stakeholders by adding untruthful statements and information about the products such ads will be treated as unethical.
4. The advertisements should follow three moral principles i.e. honesty, social responsibility and upholding self-respect .

Review of literature:

A study of relevant literature shows one the various studies which pertain to the extent of value degeneration boosted by Printed Advertisements. There are statistics-based evidence to prove this situation and are very prominent in the current world. Some of the major studies carried out across different countries, during different periods, on the same have been reviewed. The following are the founding of a few books that have enlightened the minds of many.

Most of the reviewed literature showed that are generally criticized for targeting children (Kunkel, 1988; Haefner, 1991; Kunkel, 1992; Browne, 1998; Graves, 1999; Pechmann and Shih, 1999; Childs and Maher, 2003; Saffer and Dave, 2003; Sinha, 2005), excessive use of sex appeals (Pollay, 1986; Henthrone and LaTour, 1994; Ford *et al.,* 1997), stereotypical presentations of women (Chatterji, 2005; Schaffter, 2006), negative psychological effects on the viewers (Richins, 1991; Fay and Price, 1994; Nuta, 2009) and promoting materialism (Richins, 1995; Roy, 2006; Chan and Cia, 2009; Nuta, 2009). While investigating the influence of advertisements directed at children, it was found that they do have an adverse influence on child behavior. Due to lack of ethical vibes, the aids fail to give any positive effects. Effective balance in the children is lost and it has been seen that they have emotions pouring out in their most unexpected ways. Kunkel (1988) conducted a study in which the values of the advertisers who target children were questioned.

It was suggested that advertisements which target children are unethical because children are not in a position to evaluate commercial persuasion. Arguments have been initiated by critics stating that advertisements directed at children are harmful because they serve to glorify the use of alcohol and tobacco, (Pechmann and Shih 1999; Saffer and Dave, 2003; Sinha, 2005) create awareness among children of their sexuality at a tender age (Kunkel, 1992) and inculcate stereotypes of gender among them (Browne, 1998; Graves, 1999; Childs and Maher, 2003).

Objective of Study:

The study is carried out with the following objectives

1. To determine whether the advertisements were built through ethical values.
2. To evaluate the effects of ethical and unethical advertisements on respondents.
3. Influence of advertisements on children and women.
4. Examine the ethical principles of advertising

Scope Of The Study:

The study covers the ethical values in the advertisements and the rules and regulations followed by the advertiser and what are the effects of unethical advertisements on children and women and different stakeholders , and how an unethical advertisement deceives the customer in general.

Hypothesis:

1:H1 Print advertisement does not have adverse effects on stakeholders.

H0 Print advertisement have adverse effects on stakeholders.

2:H1 There is no significant difference between perceived ethicality and actual ethical practices in print advertising.

H0 Print advertisements that comply with ethical standards are perceived more positively by consumers.

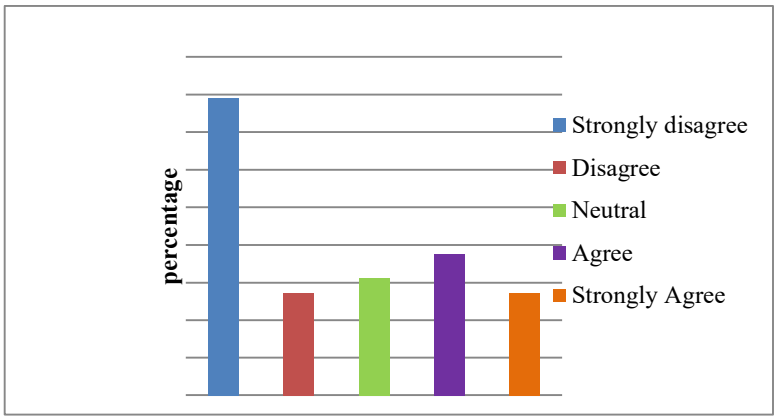
3: H1 Unethical advertising practices positively influence brand reputation and consumer trust.

H0 Ethical advertising practices positively influence brand reputation and consumer trust.

Research Methodology and Data Interpretation:
The study of ethics and print advertisement is based on both primary and secondary data obtained. Primary data is totally derived from feedback by different stakeholders from the society through questionnaire and secondary data is obtained from books and journals as and when available.

Q No. 1: Is Print advertisements is always being truthful and transparent.

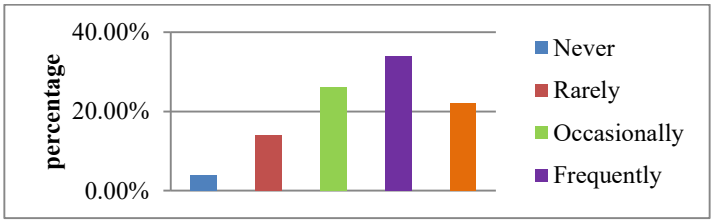
Strongly disagree		Disagree		Neutral		Agree		Strongly Agree	
Count	%	Count	%	Count	%	Count	%	Count	%
38	39.5%	13	13.54%	15	15.625%	18	18.75%	13	13.54%



Interpretation:
Since p-value for the chi-square test is less than that of 0.05 indicates that the proportion of respondents who strongly disagree is maximum. Hence we conclude that Print advertisement is not always being truthful and transparent.

Q No. 2: How often do you notice ethical issues in print advertisements?

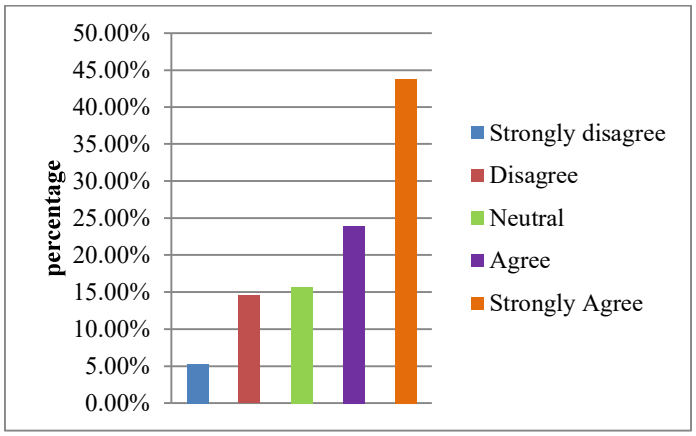
Never		Rarely		Occasionally		Frequently		Always	
Count	%	Count	%	Count	%	Count	%	Count	%
4	4.2%	14	14.6%	26	27 %	31	32.3 %	21	21.88%



Interpretation:
Most peoples responded that print advertisement have frequently ethical issues. Since p-value for the chi-square test is less than that of 0.05 indicates that the proportion of respondents who agree that there are frequently ethical issues is more than that those who never agree, hence we conclude that it has ethical issues.

Q No. 3: Print advertisement such as Hair oils exploits consumers.

Strongly disagree		Disagree		Neutral		Agree		Strongly Agree	
Count	%	Count	%	Count	%	Count	%	Count	%
5	5.2%	11	14.5%	15	15.6%	23	23.9%	42	43.8%

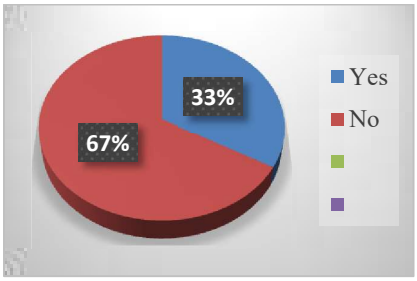


Interpretation:

Most peoples responded that print advertisement exploits consumers. Since p-value for the chi-square test is less than that of 0.05 indicates that the proportion of respondents who strongly agree that it is more than that those who don't agree, hence we conclude that it exploits consumers

Q No.4: Do you think print advertisements are generally ethical?

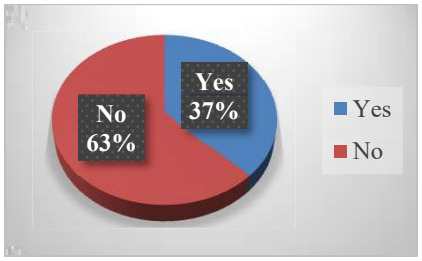
	Count	Column N %
Yes	32	33.33%
No	64	66.67%



Interpretation: Most people responded that print advertisements are generally not ethical.

Q No. 5: Is Print advertisement honest and trustworthy

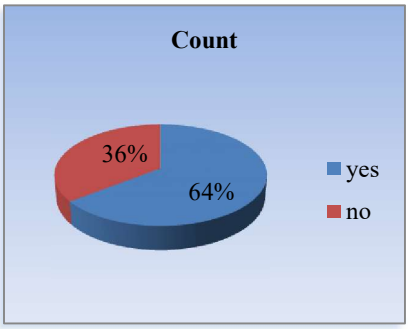
	Count	Column N %
Yes	36	37.5
No	60	62.5



Interpretation: Major part of stakeholders responded that print advertisements are not honest and trustworthy ethical.

Q No. 6: Does print advertisement effects on person psychology?

	Count	Column N %
Yes	62	64.5%
No	34	35.5%



Interpretation: Few people responded that print advertisements does not have any psychology effect whereas many responded there is psychology effects.

From the above discussion with stakeholders we can see that many of the advertiser do not practice the ethics in advertisement for the chaos of increasing their sales. Indian masses are adversely affected due to wrong information and nudity in print advertisement.Print advertisements in India follows both ethical and unethical norms which effects human psycology. To compete with other brands the advertiser exploit the consumers with false claim of the product.

Suggested Measures to overcome the drawbacks of negative impacts:

1. No advertisement shall be aired which leads the consumers to believe that if they do not own or use the product advertised, they will be inferior in some way to others or that they are liable to be condemned or ridiculed for not owing or using it. Thus it is suggested that the advertisements shall not be allowed to take the advantage of the superstitions or ignorance of the general public.
2. Based on the study it has been suggested that advertising shall reveal the truth and shall reveal significant facts, the omission of which would mislead the public
3. Advertising should endeavor to gain the goodwill of the public on the basis of merits of the goods or services advertised. Hence the direct comparison with competing goods or films should be avoided and disparaging reference in no circumstances should be permitted
4. The advertisements in any media should enhance the public morality and living standards of the general Public. It is recommended to the prints owners that only the advertisement which will give women prestige, code of conduct, moral values and thereby increase the standard of living and maintaining good living style of the consumers should be permitted to be aired.
5. Keep pursuing the activities and remove ads which don't accomplish the codes.
6. Aware the stakeholders about the self-regulatory codes of the organization.
7. Draw attention on the complaints coming from stakeholders about the product ads.
8. Maintain transparency throughout the organization and system.

Conclusion:

This study reveals the importance of ethics, morality and standards to be applied for designing the good advertisements copy, deciding for selective advertisement message and delivering the whole of advertisement in the right prints and in a decent way. Print advertisement also provides good information about the societies and political backgrounds and keep youth and old age peoples connected with the recent realistic scenario. Print advertisement is as necessary for information and it is our responsibility to use it as good source of information and we should not spread wrong information and should not misuse the power of print advertisement

References:

1(Pechmann and Shih 19199; Saffer and Dave, 2003; Sinha, 2005)
2 www.google.com
3Google scholars

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A Comparison Between Mutual Funds & Other Investment Options

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Abstract:
This paper presents a comprehensive comparison between mutual funds and alternative investment options, aiming to provide investors with insights into the features, risks, and potential returns associated with each. Mutual funds have long been a popular choice for investors seeking diversification and professional management. However, alternative investment options such as stocks, bonds, real estate, and exchange-traded funds (ETFs) offer distinct advantages and considerations. Through a systematic examination of factors like risk, liquidity, cost, and potential returns, this paper seeks to assist investors in making informed decisions tailored to their financial goals and risk tolerance.

Keywords: Mutual Funds, Alternative Investments, Diversification, Risk, Returns, Portfolio Management.

Introduction:

Investing plays a pivotal role in building wealth and achieving financial goals. With a plethora of investment options available, investors often face the challenge of selecting the most suitable avenue for their capital. Mutual funds have traditionally been a favored choice, offering diversification and professional management. However, alternative investment options present compelling alternatives, each with its unique characteristics and considerations. This paper aims to compare mutual funds with alternative investment options, providing investors with a comprehensive understanding to make informed decisions.

Mutual Funds:

Features and Considerations:

Mutual funds pool money from multiple investors to invest in a diversified portfolio of securities, managed by professional fund managers. They offer several advantages, including diversification, professional management, and liquidity. Mutual funds are categorized based on asset class, investment objective, and risk profile, providing investors with a wide range of options to suit their preferences. However, they also entail certain drawbacks such as management fees, expense ratios, and potential for underperformance compared to benchmark indices.

Alternative Investment Options:

1. **Stocks:** Investing in individual stocks provides the opportunity for high returns but carries substantial risk due to volatility and lack of diversification. Investors must conduct thorough research and analysis to select promising companies and manage risks effectively.
2. **Bonds:** Bonds offer fixed income streams and capital preservation but typically yield lower returns compared to equities. They are favored by conservative investors seeking income and stability within their portfolios.
3. **Real Estate:** Real estate investments encompass residential, commercial, and industrial properties, offering potential for appreciation, rental income, and diversification. However, they require significant capital, expertise, and ongoing management.
4. **Exchange-Traded Funds (ETFs):** ETFs combine features of mutual funds and individual stocks, offering diversification, liquidity, and low expense ratios. They track various asset classes, sectors, and indices, providing investors with flexibility and convenience.

Comparative Analysis:

1. **Risk:** Mutual funds offer diversified portfolios, reducing specific risk but may still be exposed to market fluctuations and systemic risk. Alternative investments like stocks and real estate carry higher volatility and individual company or property risk. Bonds are generally considered less risky but still subject to interest rate and credit risk.
2. **Returns:** Mutual funds aim to generate competitive returns relative to benchmark indices, adjusted for fees and expenses. Alternative investments offer varying returns depending on market conditions, asset performance, and individual strategies. Stocks historically have provided the highest long-term returns, while bonds offer stable but lower returns.
3. **Liquidity:** Mutual funds provide daily liquidity, allowing investors to buy or sell shares at the current net asset value (NAV). Alternative investments such as real estate may have limited

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A Study on Impact of Government Finance Scheme Awareness, Access and Perception on the MSME's in Mumbai

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Abstract:
This study investigates the impact of government finance scheme awareness, access, and perception on Micro, Small, and Medium Enterprises (MSMEs) in Mumbai, India, a thriving hub of commerce and industry. Through a mixed-methods approach combining quantitative analysis and qualitative insights, the research explores the intricate dynamics shaping the relationship between government support and MSME performance. The researcher have taken into consideration a total of 123 MSMEs in Mumbai. With the help of structured questionnaire the data was collected which helped in fulfilling the objectives of the study. To test the hypothesis various statistical tools like Correlation, One-way ANOVA and T-Test were employed. The data was processed and analysed in Microsoft Excel. Findings reveal a nuanced landscape of awareness, access, and perception among MSMEs in Mumbai regarding government financial schemes. While a substantial proportion of MSMEs demonstrate awareness, there is a notable gap in accessibility and satisfaction with government support, indicating areas for improvement. Efforts to increase awareness through targeted campaigns and streamline application processes are identified as key strategies to enhance scheme effectiveness.

Keywords: Finance, Financial Scheme, Awareness, Accessibility, Perception, MSMEs

Introduction:

Micro, Small, and Medium Enterprises (MSMEs) have long been acknowledged as the backbone of economic growth and development, particularly in emerging economies like India. In recent years, the Indian government has rolled out various finance schemes aimed at bolstering the MSME sector, recognizing its pivotal role in employment generation, poverty alleviation, and fostering entrepreneurial spirit. However, the effective implementation and impact of these schemes hinge not only on their availability but also on the awareness, accessibility, and perception of the MSMEs towards them. This research embarks on a comprehensive study to delve into the intricate dynamics between government finance scheme awareness, access, perception, and their consequential impact on MSMEs in the bustling metropolis of Mumbai.

Mumbai, often dubbed as the financial capital of India, stands as a microcosm of the broader Indian economy, characterized by its vibrant MSME ecosystem intertwined with the fabric of commerce and industry. Amidst the pulsating energy of this megacity, MSMEs form the lifeblood of its economic landscape, contributing significantly to employment, industrial output, and export earnings. However, despite their undeniable significance, MSMEs in Mumbai face multifaceted challenges, ranging from regulatory hurdles to financial constraints, impeding their growth trajectory and hampering their full potential realization.

Central to addressing these challenges are the various government finance schemes meticulously crafted to provide financial assistance, facilitate credit access, and foster entrepreneurial development among MSMEs. From the Prime Minister's Employment Generation Programme (PMEGP) to the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), these schemes epitomize the government's commitment to empowering MSMEs and propelling inclusive economic growth. Nevertheless, the effectiveness of these schemes remains contingent upon the extent to which MSMEs are aware of their existence, can readily access them, and perceive them as viable instruments for business augmentation.

The significance of awareness, access, and perception pertaining to government finance schemes in shaping the fortunes of MSMEs cannot be overstated. Awareness serves as the initial stepping stone, empowering MSMEs with knowledge about the plethora of schemes available and their respective eligibility criteria, benefits, and application procedures. Accessibility, on the other hand, determines the ease with which MSMEs can navigate through bureaucratic channels, avail financial assistance, and translate opportunities into tangible outcomes. Meanwhile, perception

encapsulates the subjective judgments and attitudes harbored by MSMEs towards these schemes, encompassing aspects such as trust, credibility, and perceived utility.

Against this backdrop, this research endeavors to unravel the intricate interplay between government finance scheme awareness, access, perception, and their consequential impact on MSMEs in Mumbai. By adopting a multifaceted approach encompassing empirical analysis, qualitative interviews, and stakeholder perspectives, this study seeks to offer valuable insights into the factors influencing MSME participation in government finance schemes, identify barriers impeding their uptake, and propose actionable recommendations to enhance scheme efficacy and MSME engagement.

In essence, this research not only seeks to contribute to the academic discourse surrounding MSME development but also holds practical implications for policymakers, financial institutions, and MSME stakeholders in Mumbai and beyond. By illuminating the nexus between government finance scheme awareness, access, perception, and MSME outcomes, this study aspires to catalyze informed decision-making, foster strategic interventions, and pave the way for a more vibrant and resilient MSME ecosystem in Mumbai, thereby advancing the overarching goals of inclusive growth and sustainable development.

Literature Review:

In another related to government policy actions and MSMEs, Khaksar (2011) explained the role of government policy and the growth of entrepreneurship in MSMEs and revealed that a mix of policy options that policymakers should consider. Such factors are the structure of labor force, prevailing attitudes of population towards entrepreneurship, the role and size of government in executing the services, and finally, the prevalence of existing level of entrepreneurial activity and the existing MSMEs. Researchers further concluded that employment in agriculture is declining at an increasing rate, and the main responsibility of job creation lies with the unorganized sector, including the service sector and small and medium enterprises. Some researchers investigated the performance of MSMEs such as Muthu (2015) researched the cause of sickness in micro, small, and medium enterprises in India. The researchers suggested that new approaches like the cluster approach or harnessing the power of industry associations should be encouraged to prevent the major sickness in the MSME sector in India.

Some academicians worked on the skill level of the MSMEs employees like Devi and Ramachandran (2016). They have investigated about training and skill development activities for MSMEs in India. The focus of the study is on the training activities of MSME – DIs and from the angle of enterprise technology innovation, put forward the enterprise training strategies which should be adopted in small and medium-sized enterprises. Pandya (2017) Studied about awareness and availing of various direct and indirect fiscal incentives and its impact on financial and strategic decisions of MSMEs. Researchers attempted the study to examine the different types of incentives given to the MSMEs through the interview cum survey method. The outcomes of the research are, the government should improve awareness of incentives and reduce the procedural complexities to avail it.

To understand the issues and challenges in financing MSMEs research studies should take into account the perspectives of both the lender and the borrower (Bhuyan Ujjal (2016) The bankers reported that non-availability of financial records relating to income, business transactions and accounts of MSMEs was the major challenge in credit appraisal of MSMEs. Despite extant instructions mandating banks not to accept collateral security in the case of loans up to ₹10 lakh extended to MSE units, there were instances of Sen, K., & Salim, S. (2016) accepting collateral in such loans by banks. This also indicated that the bankers' preferred collateral-based lending (Tahura Pervin & Razia Begum & Bipul Kumar Sarkar, (2020). The loan taken from lending institutions are being utilized properly but it is not helping or directly influencing the formation of capital. Research conducted emphasis the need to assess empirically the financial obstacles associated with different stages of MSME Life Cycle in accessing the finance and also its impact on the MSME performance.

Objectives:

With the aim of studying the Impact of Government Finance Scheme on the MSME's in Mumbai, the main objectives of the present study are as follows -

1.To Determine the extent of correlation between awareness and utilization of government financial schemes among MSMEs in Mumbai.

2.To assess the impact of access to government financial schemes on the financial performance of MSMEs in Mumbai.

3.To compare perceptions of government policy effectiveness between MSMEs utilizing and not utilizing financial schemes in Mumbai.

Hypothesis of the Study:

Hypothesis 1

H0- There is no significant positive relationship between the awareness level of government financial schemes among MSMEs in Mumbai and their utilization.

H1- There is a significant positive relationship between the awareness level of government financial schemes among MSMEs in Mumbai and their utilization.

Hypothesis 2

H0: The access to government financial schemes does not significantly influences the financial performance of MSMEs in Mumbai.

H1: The access to government financial schemes significantly influences the financial performance of MSMEs in Mumbai.

Hypothesis 3

H0: There is no significant difference in the perception of MSME owners/managers regarding the effectiveness of government policies between

Research Findings: those who have utilized government financial schemes and those who haven't in Mumbai.

H1: There is a significant difference in the perception of MSME owners/managers regarding the effectiveness of government policies between those who have utilized government financial schemes and those who haven't in Mumbai.

Research Methodology:

The research methodology employed in this study involves a mixed-methods approach, combining quantitative analysis with qualitative insights. Surveys were conducted among MSMEs in Mumbai to gather quantitative data on their awareness, accessibility, and perception of government financial schemes, as well as their financial performance. Statistical analysis techniques such as correlation, ANOVA, and t-tests were utilized to test the hypotheses derived from the research objectives.

Additionally, qualitative interviews and stakeholder perspectives were incorporated to provide in-depth insights and contextual understanding. This comprehensive approach ensures a holistic examination of the impact of government finance scheme awareness, access, and perception on MSMEs in Mumbai.

Table 1: Years Operational	Frequency	Percentage
Less than 1 year	18	14.63%
1-3 years	54	43.90%
4-6 years	33	26.83%
7 years or more	18	14.63%

The data illustrates the distribution of years of operation among MSMEs in Mumbai. It shows that the majority (70.43%) have been operational for less than 6 years, with 43.90% operating for 1-3 years and 26.83% operating for 4-6 years. This suggests a dynamic landscape with many relatively new businesses. However, a significant portion (29.57%) has been operational for 7 years or more, indicating a presence of more established enterprises. Understanding this distribution can help policymakers tailor support mechanisms to address the specific needs of both newer and more established MSMEs in Mumbai.

Table 2: Number of Employees	Frequency	Percentage
1-5	76	61.79%
6-10	35	28.46%
11-20	9	7.32%
21 or more	3	2.44%

The data illustrates the distribution of employees among MSMEs in Mumbai. A significant majority (61.79%) of these businesses reported having 1-5 employees, indicating a prevalence of small-scale operations.

Meanwhile, 28.46% reported having 6-10 employees, suggesting a moderate workforce size.

Only a small proportion reported having 11-20 employees (7.32%), while an even smaller fraction (2.44%) reported having 21 or more employees, indicating a concentration of larger enterprises.

Understanding the distribution of employees provides insights into the scale and capacity of MSMEs in Mumbai, which can inform policy and support measures tailored to their specific needs.

Table 3: Awareness of Government Financial Schemes	Frequency	Percentage
No	43	34.96%
Yes	55	44.72%
Maybe	25	20.33%

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A Comprehensive Study of Financial Literacy Among Muslim Women in Mumbai

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Abstract:
Financial literacy is a crucial skill in today's complex economic landscape, empowering individuals to make informed financial decisions. Despite its importance, research on financial literacy among Muslim women remains relatively scarce. Financial literacy depends upon the beliefs of Islamic shariah for Muslim women's such as prohibition of interest in financial transaction irrespective of taking or giving or agree to give, other non halal business for example banking sectors, insurance sector, interest or gambling base business etc. In this research paper researcher tried to eradicate the gap due to misunderstanding or misconception with respect to financial avenues available for Muslim minority women's.

key words: financial literacy, Shariah, Halal, Haram, Islamic Belief

Introduction:

Financial literacy plays very important role in development of human being and nation because financial literacy helps an individual in taking correct financial decision which in term develop an individual and a nation. Financial literacy can be classified into two sectors for example modern financial literacy and Muslim financial literacy. Modern financial literacy is concerned with financial decision irrespective of any religion factors but Islamic financial literacy is concern with taking business decision sound and religious both. Muslim community lacks financial literacy hence their participation is very less in Indian financial sectors Viz. Banking, Insurance, Stock Markets etc.

Needs of the Study:

The study is more concerned about financial awareness among Muslim women as far as Muslim women is concerned financial awareness is not there hence educational impartment is very important in women's. women empowerment can be done through financial independence that must be as per shariah compliant procedure only.

Financial Literacy Sectors for Muslim Investors.

1: Banking Industry
2: Insurance Industry.
3: Stock Markets.
5: Mutual Funds.

Review of Literature

Sadegi (2008)

Investigated the impact of the introduction of Bursa Malaysia Islamic index on the financial performance and liquidity of the screening securities involved in the Islamic index in Malaysia. The study employed event study methodology to estimate mean cumulative returns of the Shariah compliant stocks in the days surrounding the event and also investigate the changes in liquidity using trade volume and bid ask spread surrounding the event days as liquidity proxies. The study found that the introduction of the Shariah index has positive and strong impact on the financial performance of the Shariah compliant stocks.

Hakim and Rashidian (2004):

analysis the risk and return of the Dow Jones Islamic World Index Dow Jones World index and Dow Jones Sustainability (DJS) World index by using weekly closing value of the indices and LIBOR a proxy of the risk-free rate during period January 5, 2000 to August 30, 2004. By employing CAPM, the results of the study reveals that the most popular index is market competitive but has underperformed in relation to another morally restricted but non-Islamic index. The study concludes that investors in the Muslim index are not suffering a discernible cost for complying with the Shariah restriction.

Venkataraman (2004) :

Compared the psychology of women investors with men and found that although women like to get the highest yields whereas almost of them make secret savings and utilize it secret money on gold, jewelry or apparels. Also, they prefer to invest more in jewelry.

Agarwal (2010):

Observed that women do not possess the requisite skills to make successful investment and financial decisions which generates the need for financial literacy.

Mathivathani and Velumani (2014) took a study to understand the level of financial literacy among women. The study understood that financial literacy of marginalized rural women is very low. Hence, the proper development of financial literacy

will help women for good financial decision making and proper utilization of financial services and products

Objectives of the Study :

The specific objectives of the study are:

1. To know the financial literacy among Muslim women's.
2. To impart the knowledge of shariah financial products among Muslim women's.

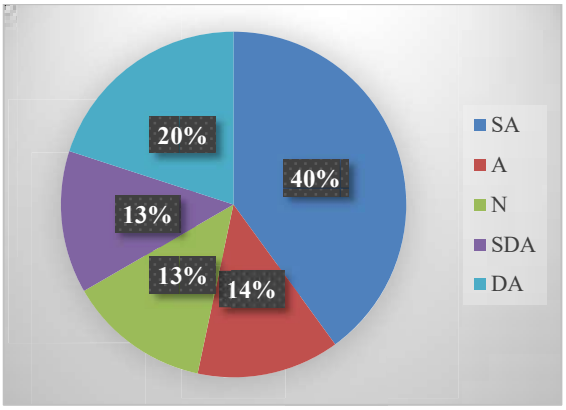
Methodology of the Study:

The study is based on both primary and Secondary Sources of data. It includes questionnaires method of data collection and available published literatures such as books, journals, newspapers and relevant government websites.

Data Analysis and Interpretation:

Q No. 1: Do you think the concept of stock market is not familiar among Muslim women's .

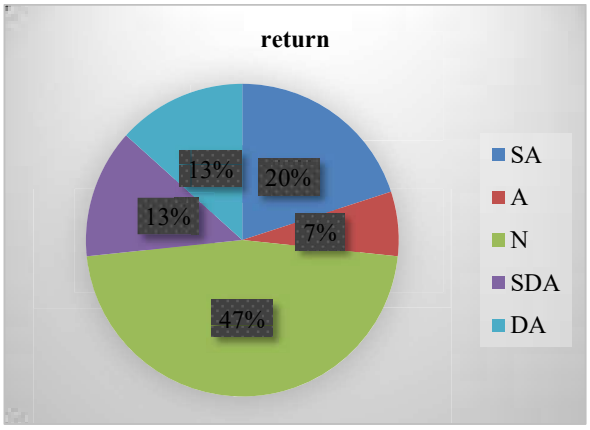
SA	A	N	SDA	DA	TOTAL
30	10	10	10	15	75



From the above data it is interpreted that most of the Muslim woman don't know the concept of stock market and major portion after such category is strongly disagree that it is familiar.

Q No. 2: Does stock market give good return.

SA	A	N	SDA	DA	TOTAL
15	5	35	10	10	75



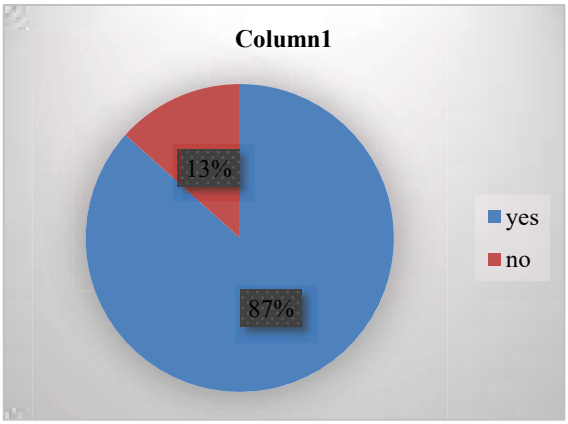
Most of the responded says that they are neutral on understanding of returns on stock market may be because they are not aware about stock market or they are not an active participant of stock market.

Q3: Interest receives on investment is prohibited in shariah.

	No of respondent
Yes	65
No	10
Total	75

It can be observed that most of the respondents agreed that interest is not allowed in Islam it means they are aware about the fact that earning of interest is impermissible and will have negative impact of interest on their income. Minimal percentile are disagreed about interest elements may be due to lack of knowledge and awareness.

Q 4: can a Muslim use credit card.

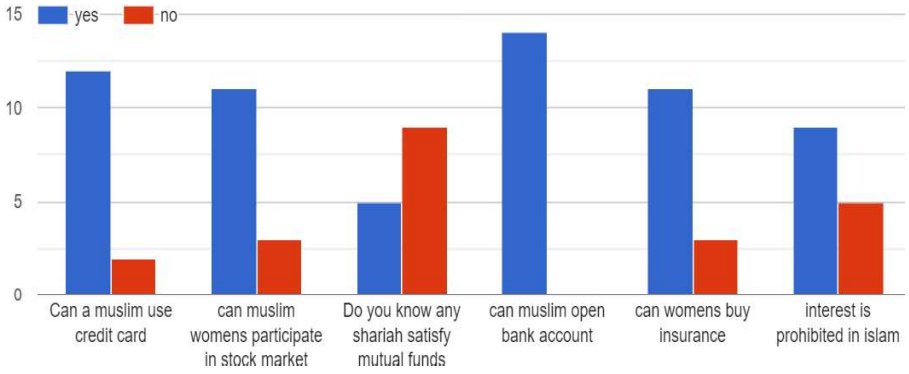


Interpretation:

It can be observed that most of the respondents agreed that credit cards is not allowed in Islam it means they are aware about the fact that cards is impermissible and will have negative impact of its usage on their income. Minimal percentile is disagreed about usage of cards elements may be due to lack of knowledge and awareness.

Q 5. Yes / No type question

Question	Yes	No	Total	Percentage
1. Can a Muslim use credit card]	65	10	75	87
2. can Muslim women participate in stock market	35	40	75	47
3. Do you know any shariah satisfy mutual funds	10	65	75	13
4. can Muslim open bank account	25	50	75	33
5. can women's buy insurance	15	60	75	20
6. Interest is prohibited in Islam	70	5	75	93



Conclusion:

From the above data we can conclude that there is lack of financial literacy among Muslim women in India may be due to non-educational background of the community or due to lack of approach to financial sectors. There are lots of hindrances among Muslim women's dur to family issues and relationships. Most of the women are not aware about the financial products available in banking sectors, stock market etc.

Suggestion:

1. Financial programme must be conducted in women's
2. Educational upliftment
3. Minority development programme

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(57) Abstract :
ABSTRACT OF THE INVENTION: The Project titled "Melanoma Detection System" is an attempt made to design a computer system that makes the Information Clear about The Melanoma and their types. The objective of this System is to maintain the details of Melanoma. Through this system we provide a smooth interface to the users for navigation through the System that provides information regarding the Melanoma and their Types. This study is limited in the use of simple image processing algorithms, for the sake of clarity, in order to illustrate the use of MATLAB in the calculation of the ABCD Total Dermatoscopy Score (TDS) for potentially malignant melanoma. A high ABCD A = Asymmetry (0-2 points), B = Border (0-8 points), C = Colour (0-6 points), D = Diameter or Differential structures (0-5 points) score means that a lesion is more likely to be a malignant melanoma. The Software powered by Matlab assures clear and efficient services to the Melanoma Detection System. This easy-to-operate system helps to access and Obtain Melanoma and their types. The software is designed to provide Reliable and error free information

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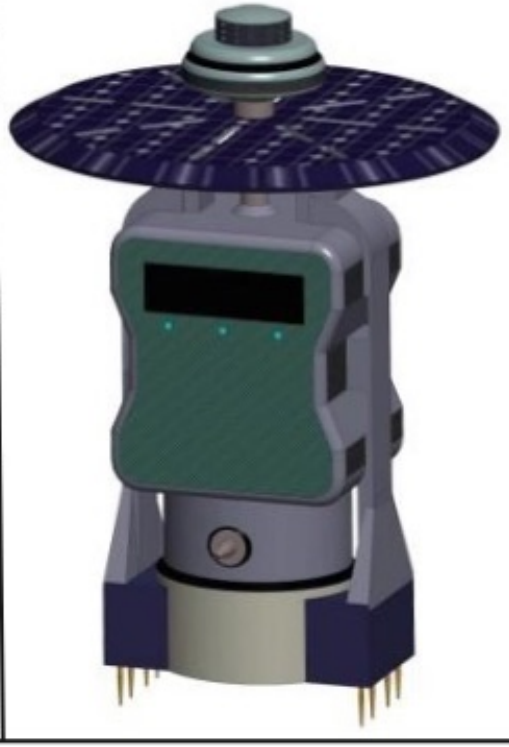
Date of Registration	24/04/2023
Title	SOLAR-POWERED SOIL ANALYSING NANO SENSOR SYSTEM
Priority NA	



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डिजाइन के पंजीकरण का प्रमाण पत्र | Certificate of Registration of Design

डिजाइन सं. / Design No.	:	384627-001
तारीख / Date	:	24/04/2023
पारस्परिकता तारीख / Reciprocity Date*	:	
देश / Country	:	

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो *SOLAR-POWERED SOIL ANALYSING NANO SENSOR SYSTEM* से संबंधित है, का पंजीकरण, श्रेणी 15-03 में 1.Prof. Minal Yadavrao Barhate 2. Dr. Dattatray G. Takale 3.Dr. Vajid N. Khan 4.Mohd Kashif Aziz 5.Dr. Yogesh Kumar Sharma 6.Avaneesh Singh के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

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डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

जारी करने की तिथि :
Date of Issue : 17/10/2023

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A Comprehensive Study of Financial Literacy Among Muslim Women in Mumbai

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Abstract:
Financial literacy is a crucial skill in today's complex economic landscape, empowering individuals to make informed financial decisions. Despite its importance, research on financial literacy among Muslim women remains relatively scarce. Financial literacy depends upon the beliefs of Islamic shariah for Muslim women's such as prohibition of interest in financial transaction irrespective of taking or giving or agree to give, other non halal business for example banking sectors, insurance sector, interest or gambling base business etc. In this research paper researcher tried to eradicate the gap due to misunderstanding or misconception with respect to financial avenues available for Muslim minority women's.

key words: financial literacy, Shariah, Halal, Haram, Islamic Belief

Introduction:

Financial literacy plays very important role in development of human being and nation because financial literacy helps an individual in taking correct financial decision which in term develop an individual and a nation. Financial literacy can be classified into two sectors for example modern financial literacy and Muslim financial literacy. Modern financial literacy is concerned with financial decision irrespective of any religion factors but Islamic financial literacy is concern with taking business decision sound and religious both. Muslim community lacks financial literacy hence their participation is very less in Indian financial sectors Viz. Banking, Insurance, Stock Markets etc.

Needs of the Study:

The study is more concerned about financial awareness among Muslim women as far as Muslim women is concerned financial awareness is not there hence educational impartment is very important in women's. women empowerment can be done through financial independence that must be as per shariah compliant procedure only.

Financial Literacy Sectors for Muslim Investors.

1: Banking Industry
2: Insurance Industry.
3: Stock Markets.
5: Mutual Funds.

Review of Literature

Sadegi (2008)

Investigated the impact of the introduction of Bursa Malaysia Islamic index on the financial performance and liquidity of the screening securities involved in the Islamic index in Malaysia. The study employed event study methodology to estimate mean cumulative returns of the Shariah compliant stocks in the days surrounding the event and also investigate the changes in liquidity using trade volume and bid ask spread surrounding the event days as liquidity proxies. The study found that the introduction of the Shariah index has positive and strong impact on the financial performance of the Shariah compliant stocks.

Hakim and Rashidian (2004):

analysis the risk and return of the Dow Jones Islamic World Index Dow Jones World index and Dow Jones Sustainability (DJS) World index by using weekly closing value of the indices and LIBOR a proxy of the risk-free rate during period January 5, 2000 to August 30, 2004. By employing CAPM, the results of the study reveals that the most popular index is market competitive but has underperformed in relation to another morally restricted but non-Islamic index. The study concludes that investors in the Muslim index are not suffering a discernible cost for complying with the Shariah restriction.

Venkataraman (2004) :

Compared the psychology of women investors with men and found that although women like to get the highest yields whereas almost of them make secret savings and utilize it secret money on gold, jewelry or apparels. Also, they prefer to invest more in jewelry.

Agarwal (2010):

Observed that women do not possess the requisite skills to make successful investment and financial decisions which generates the need for financial literacy.

Mathivathani and Velumani (2014) took a study to understand the level of financial literacy among women. The study understood that financial literacy of marginalized rural women is very low. Hence, the proper development of financial literacy

will help women for good financial decision making and proper utilization of financial services and products

Objectives of the Study :

The specific objectives of the study are:

1. To know the financial literacy among Muslim women's.
2. To impart the knowledge of shariah financial products among Muslim women's.

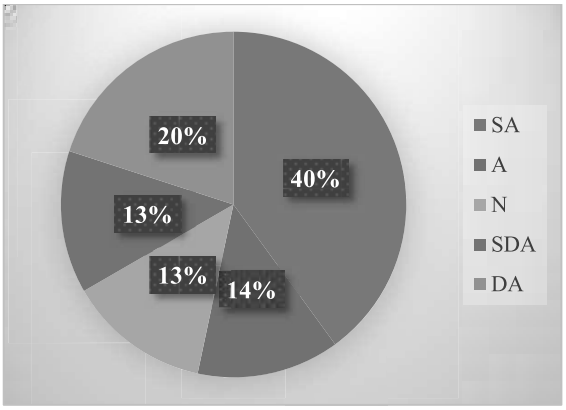
Methodology of the Study:

The study is based on both primary and Secondary Sources of data. It includes questionnaires method of data collection and available published literatures such as books, journals, newspapers and relevant government websites.

Data Analysis and Interpretation:

Q No. 1: Do you think the concept of stock market is not familiar among Muslim women's .

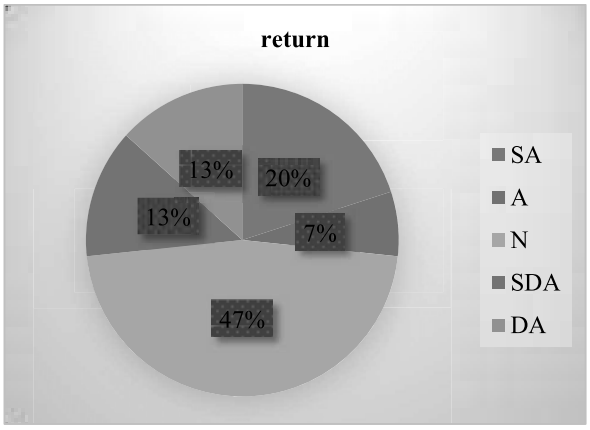
SA	A	N	SDA	DA	TOTAL
30	10	10	10	15	75



From the above data it is interpreted that most of the Muslim woman don't know the concept of stock market and major portion after such category is strongly disagree that it is familiar.

Q No. 2: Does stock market give good return.

SA	A	N	SDA	DA	TOTAL
15	5	35	10	10	75



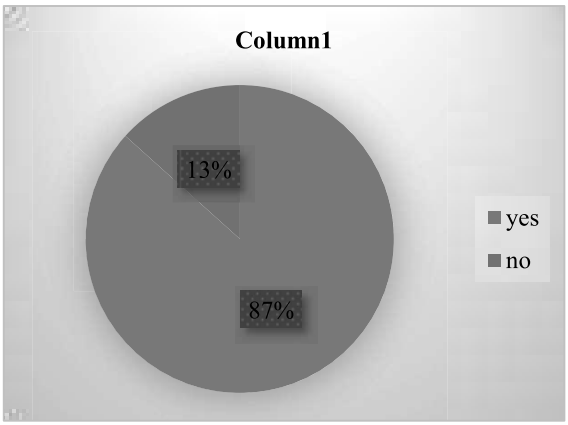
Most of the responded says that they are neutral on understanding of returns on stock market may be because they are not aware about stock market or they are not an active participant of stock market.

Q3: Interest receives on investment is prohibited in shariah.

	No of respondent
Yes	65
No	10
Total	75

It can be observed that most of the respondents agreed that interest is not allowed in Islam it means they are aware about the fact that earning of interest is impermissible and will have negative impact of interest on their income. Minimal percentile are disagreed about interest elements may be due to lack of knowledge and awareness.

Q 4: can a Muslim use credit card.

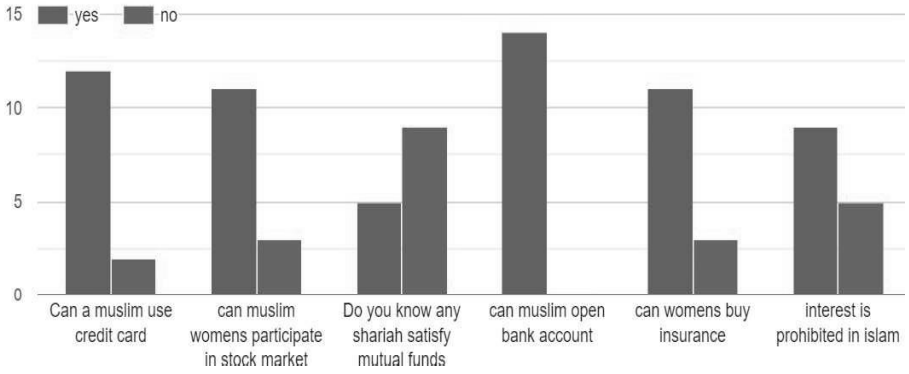


Interpretation:

It can be observed that most of the respondents agreed that credit cards is not allowed in Islam it means they are aware about the fact that cards is impermissible and will have negative impact of its usage on their income. Minimal percentile is disagreed about usage of cards elements may be due to lack of knowledge and awareness.

Q 5. Yes / No type question

Question	Yes	No	Total	Percentage
1. Can a Muslim use credit card]	65	10	75	87
2. can Muslim women participate in stock market	35	40	75	47
3. Do you know any shariah satisfy mutual funds	10	65	75	13
4. can Muslim open bank account	25	50	75	33
5. can women's buy insurance	15	60	75	20
6. Interest is prohibited in Islam	70	5	75	93



Conclusion:

From the above data we can conclude that there is lack of financial literacy among Muslim women in India may be due to non-educational background of the community or due to lack of approach to financial sectors. There are lots of hindrances among Muslim women's dur to family issues and relationships. Most of the women are not aware about the financial products available in banking sectors, stock market etc.

Suggestion:

1. Financial programme must be conducted in women's
2. Educational upliftment
3. Minority development programme

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MASOC 1.4

M.A SOCIOLOGY

SEMESTER - I

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