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Editor
Runjun Baruah

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All correspondence to be addressed to
Editor,
Lakhimpur Commerce College Research Journal ,
North Lakhimpur, Assam 787001
email: lccresearchjournal22@gmail.com

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ABOUT THE JOURNAL

Lakhimpur Commerce College Research Journal (LCCRJ), an innovative annual bilingual peer reviewed research journal is published August, 2025 by the Publication Cell of the college. LCCRJ ,Vol 7,No 1 aims to synergize various novel topics in multidisciplinary fields.The key focus of the journal is to undertake quality research papers in socio-economic, political, historical, environmental, educational, mathematical and scientific literary issues and challenges. The papers submitted to the journal entails a rigorous evaluation criteria by a forum of scholarly peer reviewers and through an editorial board. LCCRJ accepts papers on the basis of their originality ,insightful and innovative interpretation of emerging trends and challenges.

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Reviewers

EDITORIAL

Lakhimpur Commerce College Research Journal,Vol 7 No. 1 April 2024 to March 2025 provides a diverse and impactful collection of scholarly works, each contributing critical insights on education, economics, history, banking, gender justice, biodiversity, leadership, library sciences, artificial intelligence, and environmental modeling. Together, these studies reflect a compelling intersection of tradition and innovation, addressing both regional challenges and broader academic discourses. The research contributions featured in this volume exemplify the journal's commitment to interdisciplinary, socially relevant, and forward-looking discourses. These works collectively advance our understanding of issues ranging from grassroots education to global environmental resilience grounded in the regional realities of Assam and Northeast India.

The study by **Santana Saikia** provides a detailed analysis of pre-primary education in Lakhimpur district, shedding light on the infrastructural and systemic challenges that hinder the development of early childhood education. The research underscores the urgent need for inclusive, accessible, and well-resourced educational frameworks, reminding us that early education is not only a policy priority but a cornerstone of equitable societal progress.In a complementary historical exploration, **Padmeswar Dihingia and Anwesha S. Dihingia** examine the economic foundations of the Ahom polity. Their work offers valuable perspectives on how Assam's tribal and decentralized socio-political landscape evolved into a centralized agrarian economy, governed through inclusive and strategic statecraft. This historical inquiry enriches our understanding of indigenous governance models and their long-lasting impact on regional development.A significant contribution of **Birinchi Arandhara, Bipanchee Goswami, and Dr. Kumud Chandra Goswami** investigates the interplay between competition and performance among India's scheduled commercial banks. Drawing on empirical data from 2009 to 2020, the study applies metrics such as the Herfindahl–Hirschman Index and CAMEL ratios to evaluate the sector's transition post-liberalization. The findings highlight both the opportunities and pressures that competitive environments create, offering nuanced implications for financial sector policy and management.

Rupam Hazarika and Jyotishmita Borah, delver into the management of electronic resources in college libraries across Lakhimpur district. Their research reveals the evolving role of libraries in the digital age, where technology must be supported by proactive human engagement. **Dr Sikhamoni Borgohain** offers a powerful critique of mainstream feminism through an intersectional lens. The paper emphasizes the layered oppression faced by Dalit, tribal, and Muslim women in India, calling for a broader, more inclusive feminist movement grounded in social, economic, and cultural realities. This work stands as a necessary reminder that true gender justice must consider the complexities of identity, marginalization, and lived experience.

Dr. Basistha Kalita provides an account of fern diversity within the Swang Reserve Forest of Assam. The documentation of diverse species highlights the region's rich biodiversity while issuing a clear call for conservation amid increasing human encroachment. This ecological perspective, contributes meaningfully to environmental science and policy by emphasizing the importance of preserving fragile forest ecosystems.In a study of organizational dynamics, **Suraj Das and Dr. Bipasha Chetiya Barua** explore the effectiveness of transformational leadership in navigating workplace failure, using Tata Motors Ltd. as a case. Their findings demonstrate that leadership styles rooted in empathy, innovation, and psychological safety play a pivotal role in converting setbacks into opportunities for growth and resilience.

Runjun Baruah, Himadri Deka Buragohain and Akkid Ahmed examine the modernization of Indian libraries, particularly through national initiatives such as the National Digital Library of India (NDLI) and SWAYAM. The study illustrates how libraries, long-standing custodians of traditional knowledge, are evolving into digital learning hubs and serve as vital platforms for equitable access to information and education.The role of emerging technologies in academia is further explored by **Dr. Birender Pal**, who evaluates the application of generative AI tools such as NotebookLM, Consensus, Perplexity, and SciSpace. The study highlights how these tools can enhance academic research and productivity while cautioning against ethical misuse. **Dr. Dhruba Jyoti Bora** presents a statistical analysis of extreme rainfall events in Northeast India, applying L-moment methods to determine the most suitable model for regional rainfall predictionand water resource management in climate-sensitive region.

Debabrat Senapati and Dr. Nikhil Hazarika explore the evolving impact of Artificial Intelligence (AI) in the field of education. Their research highlights how AI is revolutionizing pedagogical methods by enabling personalized learning, optimizing content delivery, and addressing structural limitations in current educational systems. The study calls for a strategic integration of AI to enhance student learning experiences and educational outcomes in an inclusive and accessible manner.**Dr Rupjyoti Bhattacharjee**poignantly focuses on the emerging field of ecocriticism, emphasizing the inseparable link between literature and environmental sustainability. It thoughtfully examines how literature serves as a powerful tool for social and ecological change. This work is a valuable contribution to interdisciplinary research that seeks to inspire eco-consciousness through literary discourse and highlights the urgent need to rethink human relationships with the natural world in the face of environmental crises.In this intellectual spectrum, **Mridusmita Hazarika and Tilak Chandra Deka** offer a profound cultural and literary reflection on the universalism of Mahapurush Srimanta Sankardev's creative works. Through a nuanced analysis, they discuss how Sankardev's contributions to religion, literature, and social reform transcend regional boundaries. The study underscores how his vision laid the foundation for a cohesive and spiritually enriched Assamese society, while maintaining a timeless and universal relevance.

Dr. Ranu Pariyar and Dr. Bhabagrahi Pradhan present a compelling study on the Nepali community in Dhemaji, highlighting economic hardships, land issues, and flood coping strategies. Their recommendations for land reforms and resilient livelihoods are timely and relevant.

The insightful research paper by **Richita Hazarika** explores Artificial Intelligence as both a catalyst for industrial transformation and a source of complex ethical challenges. The author emphasize the urgent need for responsible AI practices. Their work adds valuable perspective to the global discourse on human centered and ethically aligned AI systems.

The paper titled "The *Therigatha* and the Feminist Imagination: Decolonizing Gendered Voices in Early Indian Literature" reclaims the *Therigatha*—a collection of verses by early Buddhist nuns, as one of the earliest indigenous feminist texts in Indian literature. Through a decolonial feminist lens, **Dr. Harini Patowary Das** explores how these ancient voices articulated resistance, self-liberation, and spiritual autonomy, challenging patriarchal norms long before the advent of Western feminist thought. The study positions the *Therigatha* as a vital text in global feminist discourse and Indigenous Knowledge Systems.

Through the paper titled "Village Tourism: Opportunities in Assam" **Dr. Rinti Dutta** gives an idea about that village tourism in Assam offers rich natural and cultural experiences. With proper planning, training, and sustainable practices, it can boost rural development, create jobs, and preserve traditions. A joint effort by government, communities, and businesses is the key to make Assam a top destination for authentic, responsible village tourism in India.

We extend our appreciation to all contributors for their rigorous contribution and thoughtful engagement with the themes explored. This volume will definitely inform, inspire, and stimulate further research among academicians, policymakers, and research scholars.

Runjun Baruah
Editor
Lakhimpur Commerce College Research Journal (LCCRJ)

Content

A STUDY ON THE STATUS AND PROBLEMS OF PRE-PRIMARY SCHOOLS IN LAKHIMPUR DISTRICT

SANTANA SAIKIA

ABSTRACT

Pre-primary school education is the beginning of the journey of the entire education process. The pre-primary school education starts before a child receives formal schooling. it starts from the age group of 3 years and continues till a child enters formal schooling. This pre-primary school education helps the child create their confidence and find out their learning ability, and develop the ability to survive. In this study, the investigator tried to find out the present condition and problems faced by the pre-primary school in the study area, that is Lakhimpur district, for the betterment of the children. The targeted population in this study included 4 (four) pre-primary school institutions, 20 pre-primary school teachers.

KEYWORDS: Pre-primary school, education, child, Lakhimpur district.

1. INTRODUCTION

Children are considered one of the most valuable resources. It is a responsible duty to all of us that show them the right path through which they can become a resourceful or productive member of a society. Here, pre-primary school plays a vital role. After home, school is the second place where a child

Lecturer, (PSTE) Assamese, D.I.E.T, Biswanath (Sonitpur)

spends most of their time. To enhance children's needs or to motivate them towards learning, a well-designed and child-friendly infrastructure of a school is needed. Pre-primary education provides desirable educational experiences to children in the age group of around 3 to 6 years. Recently, the new education policy 2020 clearly defines the age group of pre-school education as 5+3+3+4. This includes 5 years of foundational learning, 3 years of pre-school/ Anganwadi, and 2 years of classes 1 and 2. This pre-school education prepares a child and makes him ready to go to a primary school for his formal education. During these periods, emphasis should be given on academic learning, cognitive learning, toilet training, fine motor skill development, behavioral training, readiness for learning is nourished and useful habits for successful living, and provided. Formally, habits are laid, behavior patterns are established, and attitudes towards life are developed. Besides all of these, social, emotional, physical, cognitive, and mental development starts developing in an appropriate or organized way. New education policy 2020, under the Ministry of Human resource Development, government of India introduce a separate chapter for upgrading the early childhood education namely "Early childhood care and Education: the foundation of learning", which aim compulsory of pre-primary education for all the age group of 3 and promoting overall development and well-being until 2030.

In India, if we study the status of pre-primary education, periodically, by National Council of Educational Research and Training (NCERT) publishes a report, namely "All India Educational Survey (AIES)". According to the 30 September 2009, the 8th AIES report, there are 6,55,493 pre-primary institutions in our country. Out of these 6,04,395 (92.20%) are in rural areas. There are 30,434 Balwadis, 5,91,632 Anganwadis, 15,924 are early childhood centers, 10,237 pre-primary schools having LKG/UKG/Nursery classes, and only 7,266 unrecognized schools/institutions have pre-primary classes. In these pre-primary institutions, 8,02,007 teachers are employed. Out of these 7,56,880 (94.37%) are female teachers. The majority of teachers are i.e., 6,98,070 (87.04%), are employed in Anganwadis. National Family Health Survey-5 (2019-2020) conducted fieldwork for Assam in all 33 districts. This report states that in Assam,35% of boys and 37% of girls aged 2-4 years attend pre-primary schools. Pre-school attendance is highest in Majuli district with 56% and lowest in Dima Hasao district with 19%. A longitudinal study under the India Early Childhood Education impact study shows that in Assam, 79.1% are government. pre-primary program 6.55% are private pre-schools, and still 10.9 % are not participants.

2. NEED AND SIGNIFICANCE OF THE STUDY

The childhood period is the most extraordinary period of growth and development in a human lifetime. The foundation of all learning is laid during these years. Appropriate or quality learning carries huge future benefits. As the child grows, a well-structured, organized education program is needed. Children during this period are very curious and at the same time very undisciplined too, because they try to learn more things than whatever they learn in the home environment. Here, the need for a pre-primary school arises. Pre-primary schools give children a solid foundation upon which all learning depends which making every stage of education more efficient and more productive. Better learning in the early-stage results in major social and economic gains for society as well. Pre-school is the stage where a child expands their areas from the home surroundings. Interaction and exposure with others of the same group developed not only the communication skills but also emotional, social, and personality traits in the right way. The self-confident and independent level of a child also grows because of that. A child experiences the joy of learning in pre-primary school, which helps prevent the dropout level of the education system. A quality early childhood education helps a child to learn cognitive, behavioral, and social skills that they cannot learn at home. To build readiness for learning and immerse the child in inquiry-based learning, we cannot deny the role of pre-primary school. Thus, in light of the above conditions, it is highly significant to study or investigate the present status of pre-primary school education for better upgradation, which can secure every child’s future.

3. OBJECTIVES OF THE STUDY:

i. To study the status of pre-primary schools of Lakhimpur district, Assam.

ii. To study the material condition present in the pre-primary schools of Lakhimpur district, Assam.

iii. To find out the problems of pre-primary schools in Lakhimpur district, Assam.

iv. To provide the remedial measures for improving pre-primary schools in Lakhimpur district, Assam.

4. METHODS AND PROCEDURE

In this study, the investigator used the "Descriptive survey method", as well as a questionnaire and an observation method.

4.1. SAMPLE USED FOR THE STUDY

The present study's sample consists of pre-primary schools in the urban areas of Lakhimpur district. From the total population, the investigator selected 20 pre-primary schools using a random sampling technique.

Table No. 1 Selection of Schools

Sl. No.	Town	Number of schools	Selected sample Schools
1.	Dhakuakhana	5	3
2.	Naoboicha	6	3
3.	Bihpuriya	6	3
4.	Narayanpur	7	4
5.	North Lakhimpur	17	7
TOTAL		41	20

TOOLS

As per the need of the study, the investigator had used "questionnaire" as a tool for collecting the data.

5. ANALYSIS AND INTERPRETATION OF DATA

The analysis and interpretation of data have been done as per the objectives of the current study.

Objective 1. To study the status of pre-primary schools of Lakhimpur District, Assam

After collecting the data, the results reveal that the selected 20 schools were found under the private sector category. The school's financial conditions have been maintained from the monthly fees collected from the students admitted into the school. From the analysis of the data, it is observed that the collected sample schools follow their curriculum and develop different skills to teach the students. 75% of pre-primary schools follow both the Montessori and Kindergarten methods of teaching. But the Montessori method is more popular and is used by 10% of schools. The remaining 15% of the schools used other methods in pre-primary schools according to the demand of the curriculum.

Objective 2. To study the material conditions, present in the pre-primary school.

For pre-primary schools' playground is important. This study reveals that the pre-primary schools in the study area have their own playground. The walls of the classrooms are painted and decorated according to the children's interests. The toilet and other playing facilities are completely children-based and well-organized. Almost all the sample pre-primary schools have good drinking facilities.

Objective 3. To find out the problems of pre-primary school.

The majority of the pre-primary schools faced problems, as all of them depend on students' fees, so according to the needs of the children, sometimes it may create an unsuitable environment. Related to the teaching learning situation, inappropriate teaching methods seem to be used, and the teacher-student ratio is not matched. The study also reveals that the infrastructure facilities of the pre-primary schools are not satisfactory.

Objective 4. To provide remedial measures for the improvement of pre-primary schools.

i. A good financial condition of pre-primary schools is also important for the improvement of pre-primary schools. School authority also should not fully depend on the students' fees; rather, they should find other donations, government policies, etc., to strengthen their financial condition.

ii. A good education system is the key to the improvement of pre-primary schools. When the education system is good, all the other developments take place simultaneously. For the sake of a good educational system in schools, emerging methods and techniques should also be adopted that help in creating a strong foundation in a child's life.

iii. A group of well-trained teaching staff is also necessary for the improvement of the pre-primary schools. Maintenance of pre-primary school kids is a very difficult task. Maintaining them and providing good education is only possible when schools have a sufficient teaching staff.

iv. A proper medical facility is also important for the improvement of pre-primary school. When a child grows healthier entire education system becomes healthier. The proper maintenance of medical checkups and conditions is also important.

v. A good and proper infrastructure is very much essential for the improvement of pre-primary education. A well-designed infrastructure always attracts children. While constructing the infrastructure, one thing to keep in mind is that all terms and conditions are based on the child-centered approach.

6. MAJOR FINDINGS

Pre-primary school education is the beginning of the journey of the entire education process. A human being starts in the mother's womb. We cannot wait for the start of formal schooling. Here, the pre-primary school maintains the gap. The pre-primary school education starts before a child receives formal schooling. It starts from the age group of 3 years and continues till a child enters formal schooling. This education is very significant for a child's life. It helps the child in creating his confidence and finding out his ability of learning ability and developing the efficiency of surviving. It has a significant impact on the growth and development of the children. The pre-primary school education plays an important role in building the foundation of a child's personality. It also helps in controlling the dropout level of the education system. To make pre-primary school education successful, the condition has to be good or sufficient. In this study, the investigator tried to find out the present condition and problems faced by the pre-primary schools in the study area, that is, Lakhimpur district of Assam, for the better future of the children. As such, it cannot be considered as the representation of the whole pre-primary education system of the chosen area. Still, the findings of this study will definitely give an idea of the present conditions of the pre-primary schools. Here, the major findings of the study are mentioned accordingly.

a. In the pre-primary schools of the chosen area of study, both the Montessori as well as Kindergarten methods were used as methods for the easy understanding of the children. The Montessori method is more popular than the Kindergarten method.
b. Though examination procedures are not compulsory for the pre-primary schools, still, all the pre-primary schools of the study area conduct examinations for testing the children understanding.
c. Conducting different programs in pre-primary schools can also play a significant role in the overall development of a child's life. In this study, it is found that 75% of the schools used to conduct different programs that include Children's Day, Teachers' Day, and Environment Day, etc., which ensure 100% involvement of the students.
d. Use of audio-visual aids can make the teaching-learning process more effective. In this study, it is found that only 25% of the schools use audio-visual aids while teaching. But here it is also seen that when schools were closed due to the COVID-19 situation, all the schools used various technology to connect with the children.
e. A balanced pupil-teacher ratio is also very important for the maintenance of the pre-primary schools, because in pre-primary schools, teachers play a vital role; they are like the guardians of the child. So, a sufficient teaching staff is very much necessary. In this

study, it is found that 75% of schools have proper teaching, and the remaining 25% of schools proceed with their work with an insufficient number of teaching faculty.

f. Training makes a teacher an updated and trained teacher, his/her duty more organized than an untrained one. It is very helpful for the better development of a child. In this study, it is found that out of 75 teachers of 20 chosen sample schools, only 24% are trained, and the other 76% are untrained. We can conclude that most of the teachers of the chosen study area is untrained.

g. In-service training is also important for the development of pre-primary schools. It helps the teacher with the new bringing or concepts and helps in updating themselves with the changes. In this study, it is found that 60% of the schools have the scope for in-service training.

h. Playing games is also an important method of learning in pre-primary schools. Children used to learn things from different games as well. The result found that all the pre-primary schools of the chosen study area have proper facilities for indoor as well as outdoor sports. The result is quite satisfying among the study samples.

i. The sitting arrangements of the pre-primary schools of the chosen study area are found to be not satisfactory. Only 20% of the chosen study area schools have separate tables and chairs for every child. The remaining 80% of the schools do not have that facility.

7. CONCLUSION

Pre-primary school plays an important role in an individual's entire life journey. It is the foundational platform of an individual. The necessity of pre-primary school education is highly significant for the present society. It helps the child in surviving the current changing environment. So, the importance of pre-primary schools must be understood by all members of society and made successful. However, pre-primary school education is very important for the child's growth, as we see that the condition of pre-primary schools is not satisfactory. In the study, the investigator tries to find out that the present status and material conditions of pre-primary education are not satisfactory. It is to be mentioned that if the found drawbacks are not taken seriously, then the pre-primary school education will not become successful. The well development of a pre-primary school is very much necessary for the entire development of society and the nation. To make the pre-primary school education fully successful one everyone tries to erase the drawbacks of pre-primary education and make it easily accessible and easily reachable for all the kids without any discrimination.

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AN ECONOMIC PERSPECTIVE ON THE AHOM POLITY IN MEDIEVAL ASSAM

PADMESWAR DIHINGIA
ANWESHA S DIHINGIA

ABSTRACT

This paper examines the economic and administrative foundations of the Tai-Ahom Kingdom,which ruled Assamfrom1228 to 1826.Originating fromYunnan,China,the Tai-Ahomsunder Sukaphaatrans formed the Brahmaputra Valley from fragmented tribal societies in to a centralized agrarian polity. Central to the governance was the Paik system, a labour-cum-taxation model, which, along with state-controlled land ownership and wet-rice agriculture, ensured sustained surplus and political stability.The study explores the iradaptive administrative hierarchy, monetisation efforts, craft-based proto-industrial development, and integration of diverse ethnic groups into the state structure. Trade, both internal and external, was facilitated by strategic geography and riverine control. Cultural assimilation policies enabled efficient labour mobilisation and reduced internal conflict. The paper argues that the Ahoms' success lay in their pragmatic governance, environmental mastery, and institutional resilience. Their systems of labour, taxation, and land use continued to shape Assam's economy and society long after the dynasty's decline, leaving a lasting legacy.

Assistant Professor, Dept. of Economics, Lakhimpur Commerce College, North Lakhimpur
PG (Econ) student, Dept. of Economics, Jadavpur University, Kolkata

KEYWORDS : Ahom Kingdom,Chaolung Sukaphaa, precolonial Assam, Paiksystem, corvéelabour, wet riceagriculture,state-controlled land, agrarian economy, administrative hierarchy, cultural assimilation.

1. INTRODUCTION

The Ahoms, a Tai tribe, originated from the region of Mong Mao in Southwestern Yunnan, China. Their migratory movements into Indochina and northern Myanmar commenced in the early centuries AD. Under the leadership of Chaolung Sukaphaa (Siu-Ka-Pha), they arrived in the fertile Brahmaputra Valley in 1228, marking the genesis of the Ahom Kingdom. Sukaphaa is revered as the founder, having meticulously laid the groundwork for what would become a strong and enduring sovereign kingdom.

It and maintained its independence for nearly six centuries until 1826.[1] It is one of the longest-reigning dynasties in Indian and South-East Asian history.[6] The initial capital, established in Che-Rai-Doi in 1253 near present-day Sivasagar, marked the commencement of a significant and prosperous era for Assam.[1] Ahom rule was distinguished by a unique synthesis of indigenous and external influences that profoundly shaped its political, administrative and economic frameworks. This adaptability enabled the kingdom to successfully resist persistent Mughal expansion in Northeast India for centuries before it was annexed by the British East India Company.

The sustained political power exercised over such an extended period is a compelling indicator of deep economic capabilities and highly effective administrative systems. Without the capacity to consistently generate resources, feed its populace, fund its military, and maintain essential infrastructure, no state can withstand the test of time and external pressures. The dynasty's exceptional longevity serves as compelling evidence of its profound economic strength and the robust administrative structures that provided the necessary stability and resources for continuous governance.

The enduring economic prowess of the Ahom dynasty was fundamentally rooted in a sophisticated agrarian system centered on wet rice cultivation, an innovative labor-cum-taxation model known as the Paik system, and the strategic development of state-supported crafts and a gradually evolving trade network. These foundational elements, combined with robust political stability and a pragmatic adaptation to the unique geographical and cultural landscape of the Brahmaputra Valley, fostered a highly self-sufficient, resilient, and prosperous economy that underpinned their exceptional longevity.

2. KEY ADMINISTRATIVE STRUCTURES

The Ahom kingdom operated as a hereditary monarchy, with the king, known as Chao Pha, serving as the ultimate source of power and justice.

However, the king was bound by the recommendations of an influential Council of Ministers. This was an intricate power-sharing mechanism, which avoided absolute centralization, and likely contributed significantly to political stability by preventing unchecked royal power, fostering broader elite consensus, and decentralizing administrative burdens. This stable political environment was a crucial prerequisite, allowing long-term economic planning, investment, and growth to flourish without constant internal disruptions. Borgohain (*Chao Mung Lung*) and Burhagohain (*Chao Phrung Mung*) were positions created by the first Ahom king, Sukaphaa himself. They were members of the Ahom nobility (*Hatghoria Ahom*), and vowed not to fight for the throne and rather act as a guide to the Ahom king in matters of provincial administration in an efficient manner. A third position, Borpatragohain (*Chao Sheng Lung*), was appointed by Suhungmung 'Dihingia' King in 1527. During the illustrious rule of Suhungmung, the Burhagohain was assigned to administer the Dihing province (the region north of the Dikhow river up to Tinsukia).

Since the other two counselors refused to transfer part of the militia (*hatimur*) they commanded to the new office, Suhungmung transferred non-Ahom militia under his command to the Borpatragohain and part of the Ahom militia from the other two counselors to himself. To placate the aggrieved two counselors, Suhungmung created two additional frontier Gohain positions that were exclusive to the two lineages, and ruled that the Borpatragohain's family could not have any marital relationship with the king's lineage. Borboruah (*Phu-Ke-Lung*) and Borphukan *(Phu-Kan-Lung)* were two great positions in the Ahom kingdom, created by the Ahom king Susengpha in 1621. All Ahom territory east of the Kaliabor river and those regions not governed by the three great Gohains were placed under the jurisdiction of the Borboruah while the Borphukan had jurisdiction of the Ahom kingdom west of the Kaliabor river.

Described as a well-organized, multi-level hierarchical system, the Ahom administration was characterized as partly monarchical and partly aristocratic, or even an "oligarchical monarchy" by historian N.N. Acharyya.[5] This system's capacity for self-correction and adaptation was paramount. The Ahoms did not solely rely on their inherited traditions; they actively integrated and adapted practices and the culture of their fellow native tribes. Their arrival with advanced technologies of rice cultivation [8] and their later absorption of revenue systems from Koch and Mughal areas [3] show a pragmatic and open approach to governance and economic development. The continuous process of learning, adopting, and refining external methods, rather than rigid adherence to original systems, allowed the Ahoms to optimize their economic and administrative framework, making it more robust, efficient, and capable of supporting a vast and quickly expanding kingdom.

3. Notable Rulers and their Contributions to Governance and Economy

- **Sukaphaa (1228–1268):** As the founder and the first king, he laid the foundational political and social structures, including initiating the process of assimilation of local groups like the Borahi and Morans, and introducing the precursor to the Paik system by exacting personal service.[1]
- **Suhungmung (1497–1539):** Known as the 'Dihingia' King, he significantly expanded the Ahom territory westward into the Brahmaputra valley. He restructured the administration to accommodate newly annexed regions and diverse populations, setting the stage for a more complex bureaucracy. He also laid the early foundations for the expansion of the Paik system. He is widely considered the greatest Ahom king after Chaolung Sukaphaa.
- **Suklenmung (1539–1552):** He is credited with introducing coinage in

the 16th century, marking an early step towards a monetized economy.[3]

- **Susengpha (1603–1641):** Also known as the 'Burha' King, he implemented crucial administrative reforms, notably establishing the Borbaru and Borphukan offices.[1] He, along with Momai Tamuli Barbarua, systematically organized and implemented the Paik system, introducing specialized units like Ghora Paiks (cavalry) and Haluwa Paiks (permanent agricultural workers).[5]
- **Sutamla (1648–1663):** He further solidified the use of currency by introducing the first Ahom coins in the 17th century.[8]
- **Sukhrungpha (1696–1714):** His reign represented the zenith of Ahom power and prosperity.[1] He restructured land policies to optimize resource allocation [6] and actively encouraged extensive external trade, particularly with Tibet.[8]

4. AGRICULTURE AS A BACKGROUND TO ECONOMIC PROSPERITY

The Ahoms initiated a decisive shift from fragmented tribal subsistence systems which was dominated by shifting cultivation and localized barter into a centralized, surplus-generating wet-rice agrarian economy. This transformation was anchored in the extensive reclamation and conversion of floodplain lands into permanent paddy fields, made possible through:

- Hydraulic engineering, including bunds and embankments.
- Settler-colonization of agriculturists from neighboring tribal and caste groups.
- The dissemination of advanced plough-based wet-rice cultivation techniques, adapted from Tai models.

This shift managed to stabilize food production and created the agrarian surplus necessary to sustain a state apparatus, military organization, and artisanal specialization.

Hence, agriculture, with a strong emphasis on wet rice production, formed the indisputable backbone of the Ahom economy.[6] They were instrumental in transforming the natural landscape of upper Assam, taking primary responsibility for converting the undulating alluvial forest and marshy plains to flat rice fields which are able to hold plain water for rice cultivation via a network of embankments.[8] This active transformation of the natural landscape, rather than passive adaptation, created the fundamental productive capacity that underpinned their entire economy. This sophisticated environmental modification allowed for sustained agricultural surplus, demonstrating a level of foresight and organizational capability crucial for long-term economic prosperity.

To boost agrarian output, they systematically cultivated various rice varieties, including Sali (a highly productive, long-maturing variety requiring wet conditions and transplantation), Ahu (a short-maturing, broadcast-sown rice), and Bao (a deep-water or floating rice variety grown in low-lying lands).[6]

The process of wet rice cultivation brought by the Ahoms made the surplus production which resulted the engagement of non agrarian professional class in different activities like trade and craft. It was a complete transformation of the early agricultural system which used shifting cultivation (jhum).

A consistent surplus in the primary sector (agriculture) freed up labor and resources, enabling the development of secondary (crafts, industries) and tertiary (trade, administration, military) sectors in the kingdom.

4.1 LAND CLASSIFICATION

All land in the kingdom was owned by the state. Land was meticulously categorized by the Ahom administration to optimize agricultural productivity and resource allocation.[6] The primary classifications included:

Rupit **:** Permanently cultivated land.

Pharingati **:** Temporary fallow land.

Dalani **:** Marshy land.

Habi **:** Forested land.

Other specific classifications, such as *kothiyatoli* (land used for growing seedlings), were also used for land management. Centralized ownership of land meant that nobles and subjects were simply user of the lands, allowing the king strict control over resources and subjects. This model minimized the reliance on complex, cash-based land revenue systems in the early periods and ensured that the state could directly mobilize resources for its administrative, military, and developmental needs. This direct control fostered a high degree of economic self-sufficiency, reduced vulnerability to market fluctuations, and provided a stable, predictable resource base for the state's operations, thereby underpinning its long-term economic prowess.

5. THE PAIK SYSTEM:

The Paik system was one of the most distinctive and central feature of the Ahom economic and administrative structure, characterized as a form of 'corvee' labor that was neither completely feudal nor Asiatic[6]. Its systematic implementation is largely attributed to Momai Tamuli Borborua under the patronage of King Susengpha[5]. Under this system, every adult male between the ages of 16 and 50 was registered as a 'paik' for mandatory state service. The system was managed through a hierarchical structure of officers: Bora (over 20 paiks), Saikia (over 100), Hazarika (over 1000), and Phukan (over 6000). Paiks were organized into units called 'gots', initially comprising four individuals, later reduced to three.

Within each got, paiks rendered service to the state in rotation, with one paik serving for a period of three or four months a year, while the others managed his fields and domestic concerns. Beyond general labor, paiks were organized into professional 'khels' (guilds) based on specialized skills, contributing to various crafts and industries such as boatbuilding, arrow-making, weaving, metal casting, iron smelting, and oil pressing [3]. Due to this multi-functional design, the need for a costly standing army was eliminated while simultaneously developing critical infrastructure and guaranteeing food security for the kingdom.

5.1 EVOLUTION, REFORMS, AND CHALLENGES OF THE PAIK SYSTEM

The foundational concept of exacting personal service was introduced by King Sukaphaa.[5] Over time, reforms were introduced to address evolving needs and inefficiencies. Susengpha, for instance, implemented specialized units like Ghora Paiks (cavalry) and Haluwa Paiks (permanent agricultural workers).[6] King Sukhrungpha also restructured land policies to optimize resource allocation within the system.[6] The system required "periodic restructuring to address inefficiencies and socio-economic disparities" [6], indicating an adaptive administrative approach. The Paik system was not static; it underwent significant reforms under rulers like Kings Susengpha and Sukhrungpha [6] and required periodic restructuring to address inefficiencies and socio-economic disparities.

Land in the kingdom was not inherited, instead it was considered state property that paiks would receive in exchange for their services. This provided the Ahom state with direct and unparalleled control over the two most fundamental factors of production in an agrarian economy: land and labor. This model minimized the reliance on complex, cash-based land revenue systems in the early periods and ensured that the state could directly mobilize resources for its administrative, military, and developmental needs. The evolution from four paiks per got to three [3] and the introduction of specialized Paiks (Ghora, Haluwa) [6] demonstrated that the Ahom administration possessed a remarkable capacity for self-correction and optimization. The continuous refinement and willingness to modify a core economic institution in response to changing needs (e.g., labor shortages, evasion, military demands) was very important in maintaining its central role and effectiveness over centuries, thereby ensuring the kingdom's sustained economic output and stability.

Some of the challenges of the system included false claims to evade obligations [6] and paiks seeking exemptions, as exemplified by King Supatpha's actions against Vaishnavite disciples attempting to avoid state labor.[11] In return for their service, each paik received three puras (approximately three acres) of cultivable land (known as *gamati* or *rupit mati*) which was exempt from tax, though the land was not hereditary and could not be transferred.[10] Some accounts also mention a one-rupee revenue payment for settlement land.[11] Certain paiks, such as Chamua paiks, could be exempted from manual labor by paying compensation, while others were allotted to nobles (bilatiyas) or religious institutions (dewaliyas).[11] This model minimized the reliance on complex, cash-based land revenue systems in the early periods and ensured that the state could directly mobilize resources for its administrative, military, and developmental needs. This direct control fostered a high degree of economic self-sufficiency, reduced vulnerability to market fluctuations, and provided a stable, predictable resource base for the state's operations, thereby underpinning its long-term economic prowess.

6. TRADE AND COMMERCE IN THE KINGDOM

Initially, trade was primarily conducted through barter, and the circulation of money was limited. The introduction of coinage marked a significant economic development, first by King Suklenmung in the 16th century, and then more formally with the first Ahom coins issued by King Sutamla in the 17th century. Ahom currency consisted of cowries, rupees (Rajmohuree), and gold coins. The standard of purity for their silver coins was remarkably high, ranging from 94.1% to 98%, surpassing even British coins. Principal denominations included half rupee (Adhuli), quarter rupee (Siki), two annas (Admahia), one anna (Charatiya), and half anna (Tiniratiya). Copper coins were introduced later by King Purandar Singha. With the increase in external trade, particularly King Sukhrungpha's reign, there was a corresponding rise in the circulation of money, as he actively monetized the economy.

Inscriptions from King Sutanpha's reign, detailing commodity prices for items like rice, ghee, oil, pulses, goat, and pigeon, suggest that the barter economy was gradually being replaced by a money economy, driven by Assam's developing economic ties with feudal India and its northeastern neighbors. A notable example of trade facilitation is a coin of King Sutamla bearing Chinese characters, likely intended to facilitate trade with Tibet, indicating a strategic approach to currency for external commerce. Koch currency, *narayani*, also circulated within the valley. The transition from a predominantly barter economy to a money economy was a slow and steady process, marked by the sequential introduction of coins and a corresponding increase in monetary circulation driven by external trade. This shift is a critical indicator of economic development, moving beyond localized subsistence. A monetized economy allows for more complex and efficient transactions, greater capital accumulation, and more flexible resource allocation. This showed the Ahom

Kingdom's growing integration into the wider economic systems of medieval India and its neighboring countries.

External trade flourished under the Ahom dynasty through both well-established internal and external networks. Key commodities traded included valuable goods such as silk (particularly Muga and Eri varieties), betel nut, rice, various spices (e.g., turmeric, cardamom), metals (iron, copper, gold), elephants, and timber.[6]

Internal trade was facilitated by established markets like Kacharihat and Nagahat, which served as crucial points of exchange with neighboring hill tribes such as the Kacharis and Nagas. Additionally, overland routes through the Himalayan foothills facilitated trade with Tibet and Bhutan.[16] Urban centers within the kingdom, including Guwahati, Tezpur, and Sadiya, played central roles as distribution hubs for goods.[16] King Sukhrungpha is noted for establishing extensive trade relations with Tibet and encouraging interactions with other nations, albeit with strict limitations on foreign entry into the country. The border controls of the Kingdom were considered so strict that it was remarked, not even the wind can enter the Chao Pha's domain without his leave.

This ability to control, navigate, and utilize the land and also their extensive river system for commerce, despite natural challenges like frequent flooding of the Brahmaputra [11], demonstrates their mastery of their geographical context.

7. INDUSTRIAL DEVELOPMENT

The Ahom state actively supported various crafts and industries, which significantly contributed to the kingdom's economic self-sufficiency.

- Silk weaving (especially muga and eri), which became both a cultural hallmark and an economic asset.
- Metalwork, including weapons and tools.
- Boat building, essential for riverine warfare and transport

Other notable crafts and industries were metal casting, iron smelting, and oil pressing. Specialized craft hubs, such as Sualkuchi (renowned for weavers) and Ramdia (for oil pressers), were strategically developed to enhance productivity and efficiency.These crafts were supported by the state, often through designated artisan paiks and state-sponsored workshops (karkhanas), creating early forms of proto-industrial organization.

Women also played an indispensable role in household industries, particularly spinning and weaving, which were widespread activities. Every household had a handloom for weaving clothes. While some colonial accounts characterized Ahom trade policy as an "iniquitous monopoly"[18], the evidence suggests that Ahom rulers controlled trade within the Ahom territory through strict regulations in the form of 'chowkeys' (toll stations). This control was primarily aimed at ensuring the uninterrupted flow of certain necessary goods such as salt and for maintaining diplomacy with neighbours.

8. FISCAL POLICIES OF THE KINGDOM

8.1 REVENUE GENERATION AND COLLECTION

Revenue collection in the Ahom dynasty was primarily based on land and labor. The Paik system, functioning as a labor-based taxation model, was crucial in ensuring a steady flow of resources for governance. In Upper Assam, the Paik system meant that "no one had to pay land revenue in cash" for their allotted land. However, paiks cultivating land in excess of their rent-free allotments did pay rents in cash.[10]

Beyond the Paik system, the Ahom kings realized revenue from various other sources, including:

Commutation money: Paid by paiks who were exempted from manual labor (Chamua paiks).

Direct taxes: House tax, hearth tax, and hoe tax.

Royalties: On valuable resources such as elephants and timbers.

Duties: Levied at custom chowkis (toll stations) on trade goods. These chawkeys could generate significant revenue, with some earning as high as 12,000 arcot rupees.[18]

Tributes: Received from subordinate chiefs and kingdoms.[10]

8.2 LAND GRANTS

Land was fundamentally owned by the crown, with nobles and subjects acting as "simply user of the lands". This centralized ownership provided the king with strict control over resources and subjects. Ahom Kings granted lands for specific purposes, which were classified as:

Rajakhat land: directly controlled by the king or state.

Nankar land: granted to officials and nobility as service tenure.

Debottor land: Allocated for the maintenance of temples.

Brahmottor land: Granted to Brahmins.

Dharmottor land: Designated for broader religious and charitable purposes.

Satra Land: Allocated to various Satras (Monasteries)

This created a landed nobility (Satghariya Ahoms and allied tribes) and formalized class hierarchies, replacing kin-based egalitarianism with a feudal-like stratification.

8.3 INFLUENCE OF THE BRAHMAPUTRA VALLEY'S GEOGRAPHY AND NATURAL RESOURCES

The Brahmaputra Valley, characterized by its "ancient alluvial sediments," provided an exceptionally fertile environment ideal for the intensive wet rice cultivation that formed the core of the Ahom economy. The Ahoms' inherent knowledge of wet rice cultivation, combined with their strategic settlement in the river valleys, was considered a bedrock behind the region's economy and the formation of the Ahom state.

The geographical location of Assam, positioned at the "crossroads of South and Southeast Asia," made it a crucial hub for trade routes, facilitating extensive internal and external commerce.

The Brahmaputra Valley was also characterized by frequent flooding and seismic activity.[2] The Ahoms' success was an active triumph over its challenges. Their extensive network of embankments for flood control and their mastery of wet-rice cultivation in a flood-prone region demonstrate a sophisticated understanding of environmental engineering.

8.4 THE ROLE OF POLITICAL STABILITY

The Ahoms had a very well-organized administration with a hierarchical system with several levels[5] ensuring effective governance and resource management. The king's centralized control over land and subjects was carefully balanced by the influence of the Council of Ministers and the system of checks and balances among high officials, contributing significantly to internal stability. Political stability is explicitly recognized as a direct contributor to economic prosperity, and the Ahom Kingdom with its exceptional stability quickly managed to grow and find economic prosperity.

9. CULTURAL ASSIMILATION IN ECONOMIC DEVELOPMENT

King Sukaphaa's policy of befriending local groups like the Borahi and Morans, and the broader process of "Ahomisation," led to the integration of other ethnicities, significantly increasing the Ahom numbers and making the kingdom multi-ethnic and inclusive.[3] Rather than imposing rigid ethnic boundaries, the Ahoms pursued a policy of deliberate assimilation. They absorbed diverse tribal groups (Chutiyas, Morans, Kacharis, etc.) into the Ahom fold, often granting them land and administrative roles in exchange for loyalty and service. Inter-marriages further contributed to this assimilation process, strengthening the Ahom's control and social cohesion.[17] The integration of diverse tribes (like Kochs and Kacharis) into the Paik system was a key economic manifestation of this cultural adaptation, allowing for the efficient mobilization of a broader labor force and the absorption of local skills and knowledge. It also helped them absorb local expertise of key industries such as basket-weaving, handlooms and weapons making.

Economically, this integration meant a significantly larger and more diverse labor pool, the absorption of valuable indigenous knowledge (e.g., specific agricultural techniques, local crafts), and a reduction in internal conflicts that could otherwise drain resources. By incorporating various communities into their administrative and economic systems, particularly the Paik system, the Ahoms expanded their productive base, enhanced social cohesion, and built a more robust and stable economic foundation, directly translating cultural flexibility into economic strength.

Many Ahom taxation and land-use policies, as well as their administrative structures like the Paik and Khel systems, were so effective that they continued to influence Assam's economy and governance models even after the decline of the dynasty and into later regimes.[6] This long-term structural persistence indicates that the Ahom economic model possessed a fundamental soundness and adaptability that allowed its core principles to persist and be re-utilized by subsequent administrations. This enduring impact is a strong indicator of the depth of their economic capabilities and institutional innovation, underscoring their lasting contribution to the region's historical economic landscape. The robust economic foundations laid by the Ahoms were instrumental in the formation of the pre-colonial Assamese nation and contributed significantly to the evolution of a distinct Assamese language, culture, and identity.[4] Even in present times, a majority of people in Assam hold Ahom surnames which are not based on the caste, creed or religion of the person. While they were the primary builders of the united Assamese identity, the unique Tai culture and customs practised by them slowly phased out overtime. Increased Sanskritisation pushed the asiatic and dominant Tai race into a more Indian orbit, with more than 90% of Ahoms identifying as hindu according to the 2011 Indian Census.

10. CONCLUSION: FRAGMENTED TRIBALISM TO AGRARIAN POLITY

In summation, the Ahom intervention in Upper Assam heralded a profound transformation both structural and symbolic in the region's economic and political landscape. What had previously been a dispersed tribal ecology, marked by fluid kinship-based authority and subsistence economies, was gradually reorganized into a centralized agrarian polity. This metamorphosis entailed the institutionalization of hierarchical land relations, whereby land became not merely a subsistence base but a medium of political allegiance and social differentiation. Through integrated labor control manifested in systems such as the paik service the state secured a steady reservoir of labor for cultivation, infrastructure, and military purposes, forging a productive and extractive economy.

Crucially, this transformation was not limited to the coercive imposition of structures; it involved the strategic incorporation of diverse ethnic communities into a broader political fold. Rather than erasing indigenous identities, the Ahom polity absorbed and repurposed them, crafting a layered society wherein allegiance to the state redefined older affiliations. Surplus extraction was facilitated not only through agrarian production but also via the growth of artisanal specialization, which supported the needs of the court and elite households, thus generating new economic interdependencies.

Moreover, the emergence of proto-bureaucratic mechanisms ranging from record-keeping to ritualized authority underpinned a nascent administrative order that anticipated later state forms. The ideological foundations of this reordering were equally significant: it reconfigured local understandings of community, kingship, and economy. The Ahom state was a civilizational framework that reshaped the region's socio-economic ethos. In effect, it laid the foundational scaffolding upon which the economic edifice of early modern Assam would rise, transforming a mosaic of tribal sovereignties into a coherent, agrarian state rooted in durable institutions and integrative logics of power.

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RELATIONSHIP BETWEEN COMPETITION AND PERFORMANCE— A COMPARATIVE STUDY AMONG SCHEDULED COMMERCIAL BANKS IN INDIA

BIRINCHI ARANDHARA
BIPANCHEE GOSWAMI
DR. KUMUD CHANDRA GOSWAMI,

ABSTRACT

The paper aims to assess the level of competition and the performance of the scheduled Commercial Indian banks. The study uses panel data of 29 scheduled Indian banks for the period from 2009–2020. In this study the relationship between competition and performance of the scheduled Indian banks have been studied. The study uses the Herfindahl–Hirschman index (HHI) and the k-bank concentration ratios based on the market share of banks (Total Deposits, Total Assets and Advances). The present study provided deep knowledge of market concentration and competitiveness in the Indian banking industry. The banking reforms of 1991 have been credited for the concept of competitiveness. The study found that the overall competition in the Indian banking sector is strong, although there is increase in concentration from 2017

Research Scholars, Department of Commerce, Dibrugarh University
Professor, Department of Commerce, Dibrugarh University

due to mergers and covid-19 pandemic. The Indian banking market continues to be characterized by monopolistic competition. The various policy measures taken by the Indian government in recent years appear to have helped boost competition. A policy suggestion would be to further liberalize the banking sector for foreign investment. This study has also taken the help of CAMEL Ratios to evaluate the performance of the scheduled banks. Further in order to investigate the relationship between competitiveness and performance of the scheduled Indian banks the paper uses correlation matrix. The study has found an inverse relationship between competition and performance. The researchers found that the competitiveness is introduced by effective competition and banks are struggling for a reasonable market share in the industry. Ultimately, the customer is benefitted through competition as the banks perform better than their rivalry for providing services. The study findings justified that there is a both positive and inverse relationship between competitiveness and financial performance of banks. In order to survive in competitive world, each and every bank focuses on technology, infrastructure, design of banking products and the most important banking services

KEYWORDS: Competitiveness, Financial Performance, Concentration Ratio, Herfindahl–Hirschman index (HHI), scheduled bank.

1. INTRODUCTION

Banks provide financial services and support to the stakeholders of the economy that contributes economic growth of a country. Indian banking industry has undergone qualitative changes due to banking sector reforms. The industry is dominated by Public Sector Banks (PSBs) and they are facing formidable challenges like competition etc. Indian PSBs, are trying their best to improve their performance and preparing themselves to survive in the emerging global market. Private sector banks and foreign banks have more customer-centric policies, high quality services, new attractive schemes and computerized branches making the survival of the PSBs questionable. In this context, there is a need to examine the efficiency of public sector banks operating in India. The new generation banks are operating with their resilient policies has become a big challenge for the still orthodox PSBs of India.

There have been significant changes in the competitive conditions in the Indian banking system with the diversification of ownership of public sector banks and flexible entry norms for private and foreign banks. Competition has led to product innovation, quality customer services and new business practices in the Indian Banking Industry. The reform measures, over the years, have improved efficiency, competitiveness and financial stability of the banking sector. Competition in the banking sector results in progressive decline in the market share of PSBs and subsequent increase in market share of domestic and foreign private sector banks.

During pre-reform period, the Indian banking sector was functioning in a controlled environment. Directed interest rates, high reserves ratios (SLR, CRR) requirements were putting pressure on efficiency and financial stability of the banks.In the crisis period, the asset quality of the Indian banks deteriorated, profits declined and credit growth also stagnated at historically low. This was because of higher risk taking than their capacity; not bringing any change in their business operations.Despite rapid growth in deposits the profitability of the Indian banks was extremely low. The Committee on Financial System (CFS) in 1991 also known as Narasimham Committee initiated reform measures to improve efficiency, productivity, competition and stability of the banking sector.

The debate on the relationship between banking competition and the overall stability of the financial system has emerged recently. Primarily, two views have emerged i.e. competition-fragility and competition-stability as observed from existing literature. The competition-fragility view suggests a negative relationship between bank competition and financial stability, while the competition-stability view shows a positive relationship.

Generally, the financial performance of banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Avkiran, 1995). Much of the current bank performance literature describes the objective of financial organizations as that of earning acceptable returns and minimizing the risks taken to earn this return (Coleman, 1986).Duncan, and Elliott, (2004) showed that all financial performance measures like return on equity, return on assets, and capital adequacy are positively correlated with customer service quality scores. Bolt and. Tieman (2004) argued that in a dynamic framework, commercial banks compete for customers by setting acceptance criteria for granting loans. By easing its acceptance criteria, a bank faces a trade-off between attracting more demand for loans, thus making higher profits and deterioration in the quality of its loan portfolio. This study is to make financial comparison based on CAMEL analysis which checks capital adequacy, Asset quality, Management Soundness, Earnings quality and Liquidity to determine the performance and classifications of commercial banks.

2. REVIEW OF LITERATURE

2.1 COMPETITION OF BANKS

(Bain, 1951) studied banking system opposition is defined through the structural approach, focusing on market features like market share, and the Structure-Conduct-Performance (SCP) paradigm, which connects market structure to conduct and performance outcomes, with the help of Herfindahl-Hirschman concentration index (HHI). (Baumol et al., 1982) studied "new empirical industrial organization" by linking with the competition measures issued from economic explanations of bank behavior. Banks are encouraged to take on more risks to increase their returns, deteriorating the quality of their portfolios (Marcus, 1984; Keeley, 1990 and Carletti and Hartmaan, 2002). There are various empirical studies that are supporting this relationship. Some of the studies are: Keeley (1990) finds that increased banking competition and deregulation in the US during the 1990s decreased monopoly rents and contributed to bank failures. Hellmann, Murdock and Stiglitz (2000) concluded that the removal of interest rate ceilings, and thus generating more competitive prices, decreases franchise value and encourages moral hazard behavior in banks. Jimenez, Lopez and Saurina (2007) studied that the banking sector in

Spain and the results indicate that greater banking competition is associated with a higher risk loan portfolio (increased non-performing loans). Berger et al. (2008) has studied 23 developed nations and concluded in favor of the competition-fragility view, suggesting that higher market power reduces the risk exposure of banks. They also found that greater market power increases loan portfolio risks which could be interpreted as some evidence supporting the competition-stability view. Vives (2010) reviews the theoretical and empirical literature on the competition-stability relationship. Beck, Demirguc-Kunt and Levine (2006) studied a group of 69 countries and the results indicate that the countries who are experiencing less market concentration are less likely to suffer a financial crisis. Boyd and De Nicolo (2005) suggest that greater market power in the loan markets increases bank risks since higher interest rates charged on consumers are harder to repay. This may exacerbate moral hazard problems and, at the same time, higher interest rates attract riskier borrowers due to adverse selection problems. Moreover, in highly concentrated markets, financial institutions may believe they are "too-big-to-fail" and this may lead to riskier investments (Berger et al., 2008). Empirically, there are several studies in the post crisis period who have supported this hypothesis. Boyd, De Nicolo and Jalal (2006) and De Nicolo and Loukoianova (2006) both find an inverse relationship between higher market concentration and financial stability suggesting that the risk of bank failures increase in more concentrated markets. Liu, Molyneux and Wilson (2013) analysed the competitive conditions in 11 EU countries for the period 2000-2008 in order to examine the competition-stability relationship in banking. Liu et al. (2012) has introduced a variety of bank-specific risk indicators (the ratio of loan-loss provisions to total loans, loan-loss reserves to total loans, after-tax ROA volatility, and the natural logarithm of the Z-index) to investigate similar relationships for banks operating in South East Asia (Indonesia, Malaysia, the Philippines and Vietnam) between 1998 and 2008.

2.2 PERFORMANCE OF BANKS

(Kumar & Kumar, 2016) studied and compared (from 2011 to 2015) SBI to other public banks using a variety of financial ratios and concluded that

SBI is superior. (Karri et al., 2015) used the CAMEL model and T-test to evaluate the financial strength of Bank of Baroda and Punjab National Bank. (Chintala& Kumar, 2016) studied selected public and private bank's financial performance for five years i.e. from 2011 to 2016 and found private sector banks were the most profitable and experienced the fastest growth. (Koley, n.d.) analyzed the financial performance of State Bank of India and HDFC Bank from 2013 to 2018 applying CAMEL model and found HDFC outperformed the rest. The findings were supported when the financial performance of public and private sector banks in India was compared and evaluated from 2009 to 2012 (Goel and Rekhi 2013). (Nathwani 2011) examined into the financial performance of all commercial banks of India over a five-year period, from 1997-1998 to 2001-2002 and found banks that adapt to change, evolve, and adopt new technology to meet the needs of their customers are more likely to succeed. (C. Vanlalzawna 2018) used ratio analysis, ANOVA, and the CAMEL model to evaluate the financial performance of two public and two private Indian banks from 2008 and 2013 and concluded that private sector banks perform better in all of the selected parameters compared to public sector banks. (Al-Kaseasbah, 2018) compared SBI and ICICI bank's financial results between 2012 and 2016 adopting financial ratio analyses and hypothesis testing. (Mishra, 2015) analyzed the financial data of three select private Indian banks over a nine-year period adopting standard deviation and variance analyses. (2018, Ns et al.) used multiple regression analysis to analyze the financial performance of private commercial banks in India (HDFC, ICICI, and AXIS), and discovered that bank size, credit risk, operating quality, asset management, and debt ratio all have a major effect on internal performance, market performance, and bank profits, which illustrates the financial performance of the three selected private commercial banks.

2.3 RESEARCH GAP:

It has been observed from the review of literature that some studies have been made in the area of banks' competitiveness and performance in global context with a variety of economic environment prevalent in different countries. Further, it has also been observed that there has been no such extensive study made in the Indian banking industry covering the area of competitiveness, concentration and financial performance. Moreover, most of the studies were conducted by taking few banks either public or private sector banks and their comparison. The researchers have not come across any extensive study in the aforesaid area in Indian context. By taking into consideration all the above research gaps in the area of banking industry, the present study focused on measuring the competitiveness, concentration and financial performance of Indian banking sector with special reference to Scheduled Commercial Banks.

2.4 OBJECTIVES OF THE STUDY:

The study objectives are:

1) To measure the competitiveness of Scheduled Commercial Banks in India.
2) To evaluate the financial performance of Scheduled Commercial Banks in India.
3) To study the relationship between competition and performance of Scheduled Commercial Banks in India.

3. METHODOLOGY ADOPTED

3.1 MATERIALS AND METHODS

This study is based on secondary data gathered from annual reports of banks and ProwessIQ Database for a period of 12 years from 2009 to 2020. In this study, the researchers considered 29 scheduled Indian commercial banks incorporated on or before 31st March, 2020.

3.2Variable measurement tools

3.2.1 THE HERFINDAHL–HIRSCHMAN INDEX(HHI):

HHI indicates the amount of competition among all the firms in an industry. For measuring competition, the study has employed HHI based on Total assets, Total deposits and Advances. Higher HHI indicates lower competition or increase in market power and vice-versa. In other words, a higher value of Herfindahl-Hirschman index implies a more concentrated market and less competition. The index is computed as

$$\text{HHI} = \sum_{i=0}^{n} \quad S2\ i$$

Where $S2\ i$ the square of the market share of the ithbank and n is is the number of banks in the market. The interpretation of HHI is:

- HHI < 1 indicates low concentration so highly competitive
- HHI < 15 indicates an moderately less concentrated
- 15 < HHI < 25 indicates moderate concentration
- HHI > 25 indicates high concentration

3.2.2 K-bank Concentration Ratio (CR):

To measure the degree of market concentration, k-bank concentration ratios (three-bank, four-bank, five-bank, eight-bank and ten-bank) are used in the extant literature. In the study we have considered the three-bank CR and five-bank CR, based on Total assets, Total deposits and Advances. CR is simply the sum of the market shares of the k-largest banks:

$$CR_k = \sum_{i=0}^{n} \quad S_i$$

Where S_i is the market share of the i^{th} bank and k is the number of banks considered after ranking all the banks in descending order based on their market share. The interpretation of CRs is:

- CR=0 indicates perfect competition
- 0 < CR < 50 indicates low concentration
- 50 < CR < 80 indicates medium concentration
- 80 < CR < 100 indicates high concentration and unity indicates monopoly.

To evaluate the performance of the banks we are using CAMEL ratios which include capital adequacy, asset quality, management efficiency, earning quality and liquidity. To evaluate the relationship among competition and indicators of financial performance we have used correlation matrix.

3.2.3 LIST OF DEPENDENT AND INDEPENDENT VARIABLES

Independent Variables	Dependent Variables (CAMEL Model)
• Herfindahl–Hirschman index (HHI) • 4CR • 8CR (Total Deposits, Total Assets and Advances)	• Capital Adequacy Ratio • Advances to Assets Ratio • Government Securities to Total Investment • Net NPAs to Total Assets Ratio • Net NPAs to Total Advances Ratio • Total Advances to Total Deposits Ratio • Return on Equity Ratio • Non-Interest Income to Total Assets Ratio • ROA • Government Securities to Total Assets Ratio • Liquid Assets to Demand Deposits Ratio • Liquid Assets to Total Deposits Ratio • Liquid Assets to Total Assets Ratio

4. RESULTS AND DISCUSSION

4.1 ASSESSMENT OF COMPETITION BASED ON HHI

For measuring competition in Indian commercial banking sector, the study has employed HHI based on Total assets (HHI_{TA}), Total deposits (HHI_{TD}) and advances (HHI_{A}). The results of HHI based on the three indicators for all the banks are shown in table 4.1. The results show that there is a declining trend of HHI over the years for all the three indicators. For instance, the HHI_{TA} has declined from 10.03 in 2009 to 8.76 in 2014 and again increased to 11.37 in 2020. Likewise, HHI_{TD} has declined from 10.48 to 8.81 and again increased to 11.19 in 2018. Similar results are found in case of HHI based on loans & advances. Based on the general interpretation of HHI, the results indicate that the market structure of Indian commercial banks during 2008-2009 to 2019-2020 is found to be more competitive so less concentrated. It is also evident that the degree of competition has gradually increased over the years. The reason may be technological advancement, better quality products and services, expansion and diversification of banking business etc. The results also support the findings of earlier studies in India as well as studies in other emerging economist (Varhegyi, 2004; Yeyati and Micco, 2007; Prasad and Ghosh, 2007; Arrawatia and Misra, 2012, Maji & Hazarika, 2016).

TABLE 4.1: HHI for all the banks

YEARS	HHI_{TD}	HHI_{TA}	HHI_{A}
2009	10.03	10.48	10.06
2010	9.19	9.64	9.74
2011	8.87	9.21	9.34
2012	8.71	8.79	9.09
2013	8.64	8.81	9.35
2014	8.76	11.2	9.41
2015	8.89	9.05	9.22
2016	8.93	9.39	9.57
2017	9.45	9.88	9.85
2018	11.16	11.19	10.72
2019	10.9	11.01	11.03
2020	11.37	10.97	11.14

Source: computed from bank's annual reports.

4.1.2 ASSESSMENT OF COMPETITION BASED ON 4CR

The results for the 4CR (three-bank) based on total assets, total deposits and Loans & advances of the banks is shown in table 4.2. The table 4.2 reveals that computed ratios based on total deposits are less than 50 for all the years except 2019-2020. This implies that there is low concentration in the market or the degree of competition in Indian commercial banks during the study period is found to be high. Further, the results also indicate that CR based on total deposits has declined in 2011 as compared to that of in 2000 and has started increasing from 2016 relating to asset, deposit and loans and advances indicating increasing competition. CR based on total assets (table 4.2) exhibits the same. Further, the value of CR has decreased in the year 2016 compared to 2009 for all the cases. Thus, the results of CR based on total deposits demonstrate the results based on total assets. CR based on advances (table 4.2) reveals, the degree of concentration is less and competition is more among banks.

TABLE 4.2: 4CR for all the banks

YEARS	$4CR_{TD}$	$4CR_{TA}$	$4CR_{A}$
2009	46.35	48.6	48.15
2010	44.31	45.78	45.52
2011	44.34	44.8	44.86
2012	44.66	44.81	44.84
2013	44.38	44.37	44.91
2014	45.31	44.59	45.62
2015	45.41	44.63	44.9
2016	44.6	45.32	46.03
2017	46.04	46.79	47.42
2018	49.03	49.84	49.15
2019	48.95	49.87	50.82
2020	52.08	43.88	53.20

Source: Compiled from Annual report

4.1.3 ASSESSMENT OF COMPETITION BASED ON 8CR

The results for the 8CR (five-bank) based on total assets, total deposits and Loans & advances for all the banks is shown in table 4.3 and it reveals that the computed ratios based on total deposits are more than 70 from 2017 to 2020 and less than 70before that. This implies that there is low concentration so the degree of competition is high. Further, the results also indicate that 8CR based on total deposits has declined in 2013 as compared to that of in 2009 and started increasing from 2017. This implies increase in level of competition in the market. Likewise, 8CR based on advances (table 4.3) also reveals that the degree of concentration is less or degree of competition is high. 8CR based on loans & advances have declined in the year 2013 as compared to that of in 2009 and started increasing from 2016.

TABLE 4.3: 8CR for all the banks

YEARS	$8CR_{TD}$	$8CR_{TA}$	$8CR_{A}$
2009	67.7	70.04	70.14
2010	66.61	68.68	68.84
2011	66.63	67.85	67.89
2012	66.48	67.56	67.42
2013	66.27	67.13	67.2
2014	67.52	68.19	68.61
2015	68.04	69.02	69.11
2016	67.82	69.27	69.35
2017	68.87	70.01	70.51
2018	70.4	71.2	71.11
2019	70.82	71.33	71.9
2020	73.61	73.31	74.29

Source: Compiled from Annual report

TABLE 4.2: RELATIONSHIP BETWEEN CAPITAL ADEQUACY AND COMPETITION

		CAR	Advances to Asset ratio	Government Securities to total investment
CR4 (Total Deposits)	Pearson Correlation	-0.100	0.103	.637*
	Sig. (2-tailed)	0.758	0.750	0.026
CR8 (Total Deposits)	Pearson Correlation	-0.224	0.202	.717**
	Sig. (2-tailed)	0.484	0.529	0.009
HHI (Total Deposits)	Pearson Correlation	-0.009	-0.080	.630*
	Sig. (2-tailed)	0.977	0.805	0.028
CR4 (Total Assets)	Pearson Correlation	-0.097	-0.316	0.289
	Sig. (2-tailed)	0.764	0.317	0.362
CR8 (Total Assets)	Pearson Correlation	-0.131	-0.040	.788**
	Sig. (2-tailed)	0.685	0.902	0.002
HHI (Total Assets)	Pearson Correlation	-0.119	-0.112	0.248
	Sig. (2-tailed)	0.713	0.730	0.437
CR4 (Advances)	Pearson Correlation	-0.039	-0.035	.635*
	Sig. (2-tailed)	0.904	0.915	0.027
CR8 (Advances)	Pearson Correlation	-0.127	-0.014	.755**
	Sig. (2-tailed)	0.693	0.965	0.005
HHI (Advances)	Pearson Correlation	-0.031	-0.058	.595*
	Sig. (2-tailed)	0.925	0.858	0.041

Source: Compiled from Annual report

In table 4.2, only Government Securities to Total investment Ratio shows significance to the competitive variables. Capital Adequacy Ratio and Advances to Asset ratio doesn't have any significance to the competitive variables. Govt. Securities to Total Asset has a significance value of 0.026 and

0.009 in regard to CR4 and CR8 (Total Deposits). Here, the Pearson correlation coefficient is 0.63 and 0.71 respectively, which means there is a strong linear relationship between concentration and performance. This depicts an inverse relationship between Competition and Government Investment of the banks. Similar results for Government securities to Total Asset can be seen for HHIs and CRs (Total Asset and Advances).

TABLE 4.3:RELATIONSHIP BETWEEN ASSET QUALITY AND COMPETITION

		Net NPA to Total asset	Net NPA to Total Advances	Total investment to Total deposit
CR4 (Total Deposits)	Pearson Correlation	0.561	.580*	-.721**
	Sig. (2-tailed)	0.058	0.048	0.008
CR8 (Total Deposits)	Pearson Correlation	.659*	.672*	-.821**
	Sig. (2-tailed)	0.020	0.017	0.001
HHI (Total Deposits)	Pearson Correlation	.589*	.615*	-.725**
	Sig. (2-tailed)	0.044	0.033	0.008
CR4 (Total Assets)	Pearson Correlation	0.496	0.518	-0.471
	Sig. (2-tailed)	0.101	0.085	0.122
CR8 (Total Assets)	Pearson Correlation	.647*	.665*	-.826**
	Sig. (2-tailed)	0.023	0.018	0.001
HHI (Total Assets)	Pearson Correlation	0.470	0.490	-0.526
	Sig. (2-tailed)	0.123	0.106	0.079
CR4 (Advances)	Pearson Correlation	0.551	0.573	-.708**
	Sig. (2-tailed)	0.063	0.051	0.010
CR8 (Advances)	Pearson Correlation	.620*	.638*	-.811**
	Sig. (2-tailed)	0.032	0.026	0.001
HHI (Advances)	Pearson Correlation	.597*	.621*	-.717**
	Sig. (2-tailed)	0.041	0.031	0.009

Source: Compiled from Annual report

In table 4.3, all Asset quality Ratios shows significance to all the competitive variables, except a lesser significance to CR4 and HHI (Total Assets). Both Net NPA ratios shows good significance to all the Competitive variables, such as 0.05 and 0.04 respectively to CR4(Total Deposits). Here, the Pearson Correlation coefficient is 0.56 and 0.58 respectively, which means there is a good linear relationship between Concentration and Performance. This shows a good inverse relationship between Competition and Performance. The result for both Net NPAs is similar to other CRs and HHIs. But, Total Investment to Total Deposit shows a strong inverse relationship between all CRs and HHIs (Total Deposit, Total Asset and Advances).It shows Pearson Correlation coefficient of -0.721, -0.821 and -0.725 for CR4, CR8 and HHI (Total Deposits) and similar results for all other CRs and HHIs. Ultimately there is a strong positive relationship between Competition and Asset Quality of banks.

TABLE 4.4: RELATIONSHIP BETWEEN MANAGEMENT SOUNDNESS AND COMPETITION

		Total advances to Total Deposits	ROE
CR4 (Total Deposits)	Pearson Correlation	0.003	-.764**
	Sig. (2-tailed)	0.993	0.004
CR8 (Total Deposits)	Pearson Correlation	0.032	-.844**
	Sig. (2-tailed)	0.922	0.001
HHI (Total Deposits)	Pearson Correlation	-0.230	-.743**
	Sig. (2-tailed)	0.472	0.006
CR4 (Total Assets)	Pearson Correlation	-0.479	-0.425
	Sig. (2-tailed)	0.116	0.168
CR8 (Total Assets)	Pearson Correlation	-0.207	-.789**
	Sig. (2-tailed)	0.520	0.002
HHI (Total Assets)	Pearson Correlation	-0.211	-.581*
	Sig. (2-tailed)	0.511	0.048
CR4 (Advances)	Pearson Correlation	-0.162	-.746**
	Sig. (2-tailed)	0.615	0.005
CR8 (Advances)	Pearson Correlation	-0.192	-.778**
	Sig. (2-tailed)	0.549	0.003
HHI (Advances)	Pearson Correlation	-0.248	-.766**
	Sig. (2-tailed)	0.437	0.004

Source: Compiled from Annual report

In table 4.4, Return on Equity Ratio shows significance to the competitive variables. Total Advances to Total Deposit ratio doesn't have any significance to the competitive variables. ROE has astrong significance value of 0.004, 0.001 and 0.006 for CR4, CR8 and HHI (Total Deposits) respectively. ROE shows a lesser significance level for CRs and HHI of Total Asset and a strong significance level for CRs and HHIs of Advances. The Pearson Correlation Coefficients for all CRs and HHIs show a strong inverse relationship between Concentration and Performance. This depicts that there is a strong positive relationship between Competition and ROE.

TABLE 4.5: RELATIONSHIP BETWEEN EARNINGS QUALITY AND COMPETITION

		Non-interest income to total asset ratio	**ROA**
CR4 (Total Deposits)	Pearson Correlation	0.198	-.864**
	Sig. (2-tailed)	0.537	0.000
CR8 (Total Deposits)	Pearson Correlation	0.152	-.930**
	Sig. (2-tailed)	0.636	0.000
HHI (Total Deposits)	Pearson Correlation	0.431	-.828**
	Sig. (2-tailed)	0.162	0.001
CR4 (Total Assets)	Pearson Correlation	0.567	-0.383
	Sig. (2-tailed)	0.054	0.220
CR8 (Total Assets)	Pearson Correlation	0.394	-.880**
	Sig. (2-tailed)	0.206	0.000
HHI (Total Assets)	Pearson Correlation	0.223	-.638*
	Sig. (2-tailed)	0.485	0.025
CR4 (Advances)	Pearson Correlation	0.305	-.861**
	Sig. (2-tailed)	0.336	0.000
CR8 (Advances)	Pearson Correlation	0.345	-.882**
	Sig. (2-tailed)	0.273	0.000
HHI (Advances)	Pearson Correlation	0.392	-.863**
	Sig. (2-tailed)	0.208	0.000

Source: Compiled from Annual report

In table 4.5, Return on Asset Ratio shows significance to the competitive variables. Non-interest income to total asset ratio doesn't have any significance to the competitive variables. ROE is fully significant with values of 0.000 for CR4, CR8 and HHI of Total Deposits and Advances. Also, ROE shows a strong significance level for CRs and HHI of Total Asset and a strong significance level. The Pearson Correlation Coefficients for all CRs and HHIs shows a strong inverse relationship between Concentration and Performance. The Pearson Correlation Coefficients like -0.93 and -0.86 depicts this strong inverse relationship. This depicts that there is a strong positive relationship between Competition and ROA.

TABLE 4.6: RELATIONSHIP BETWEEN LIQUIDITY AND COMPETITION

		govt. securities to total asset	Liquid asset to Demand deposit	Liquid asset to Total Deposits	Liquid Asset to total assets
CR4 (Total Deposits)	Pearson Correlation	-0.523	.643*	0.308	0.281
	Sig. (2-tailed)	0.081	0.024	0.330	0.376
CR8 (Total Deposits)	Pearson Correlation	-.598*	.708**	0.263	0.240
	Sig. (2-tailed)	0.040	0.010	0.409	0.453
HHI (Total Deposits)	Pearson Correlation	-0.426	.598*	0.467	0.452
	Sig. (2-tailed)	0.167	0.040	0.126	0.140
CR4 (Total Assets)	Pearson Correlation	-0.209	0.322	0.463	0.489
	Sig. (2-tailed)	0.514	0.307	0.130	0.107
CR8 (Total Assets)	Pearson Correlation	-0.438	.747**	0.471	0.453
	Sig. (2-tailed)	0.154	0.005	0.123	0.139
HHI (Total Assets)	Pearson Correlation	-0.458	0.565	0.419	0.407
	Sig. (2-tailed)	0.134	0.056	0.175	0.189
CR4 (Advances)	Pearson Correlation	-0.433	.667*	0.415	0.395
	Sig. (2-tailed)	0.160	0.018	0.180	0.204

CR8 (Advances)	Pearson Correlation	-0.452	.750**	0.454	0.436
	Sig. (2-tailed)	0.140	0.005	0.138	0.156
HHI (Advances)	Pearson Correlation	-0.434	.589*	0.437	0.426
	Sig. (2-tailed)	0.159	0.044	0.155	0.168

Source: Compiled from Annual report

In table 4.6, only Liquid Asset to Demand Deposit Ratio shows significance to the competitive variables. Government securities to total asset Ratio, Liquid Asset to Total Deposit Ratio and Liquid Asset to Total Asset Ratio don't has any significance to the competitive variables. Liquid Asset to Demand Deposit Ratio has a significance value of 0.024, 0.01 and 0.04 in regard to CR4, CR8 and HHI (Total Deposits). It also shows a similar significance value in other CRs and HHIs. Here, the Pearson correlation coefficient is 0.64 and 0.71 and 0.6 for CR4, CR8 and HHI (Total Deposits) and similar to other CRs and HHIs, which means there is a strong linear relationship between concentration and Liquid Asset to Demand Deposit Ratio. This depicts an inverse relationship between Competition and Liquid Asset to Demand Deposit of the banks.

5 CONCLUSION

The aim of the present research was to gain enhanced understanding of the Competitiveness and financial performance of the Commercial Banks in India. The present study provided deep knowledge of market concentration and competitiveness in the Indian banking industry. The banking reforms of 1991 have been credited for the concept of competitiveness. The rivalry to achieve market share increased in the industry when private sector banks and foreign banks were allowed to open their branches or subsidiaries in India. Earlier, there were only few public sector banks in India working under the guidelines of the Government of India. With the entry of private sector banks and foreign banks, the new technologies were introduced in banking industry. These new entrants had full computerised branches to provide services to the customers. It has been very difficult to induce such computerisation in public sector banks. Due to the competition induced in the industry, public sector banks were imposed with the new technology. The entry of private sector and foreign banks proved to be a boon for the industry due to increased competition among banks. The effective competition always results in competitiveness. Competitiveness and market concentration are the two terms used interchangeably. Reduction in concentration increases the competitiveness of an industry. Competition among firms reduces the market concentration as the customers can approach the alternatives for the services. The Indian banking industry has become competitive during the study time period (2009-20). During the initial years of the study, Indian banking industry was highly concentrated because few large banks were holding major proportion of assets, deposits and advances. Gradually, the market concentration for assets, deposits and advances has reduced. The reduction in concentration is a sign of increasing competitiveness in the industry. Though Indian banking industry is approaching competitiveness but it has not achieved the high level of competitiveness. Moreover, it can be concluded that Indian banking industry has moved from highly concentrated to moderate concentrated industry which in fact, tends to be good for a vibrant economy. In totality, it can be concluded that the competitiveness is introduced by effective competition and banks are struggling for a reasonable market share in the industry. Ultimately, the customer is benefitted through competition as the banks perform better than their rivalry for providing services. The study results justified that there is a both positive and inverse relationship between competitiveness and financial performance of banks. In order to survive in competitive world, each and every bank focuses on technology, infrastructure, design of banking products and the most important banking services. By working on all these above-mentioned parameters, banks increase their performance as well as market share.

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EMPOWERING WOMENTHROUGH INTERSECTIONALITY: A GLOBAL PATHWAY TO EQUALITY AND JUSTICE

DR. SIKHAMONI BORGOHAIN

ABSTRACT

This research paper focuses on women's rights by analyzing how multiple oppressions, including caste, class, religion, and gender interplay to present the complexities of women's oppression. Based on Crenshaw's intersectional theory, it explores the multi-fold marginalization of Indian women. The paper also then underlines the plight of the Dalit, tribal, and Muslim women by relating the issue in question to their past, present and future that typically remains ignored in main stream feminism. The paper also rejects the current policies and legal frameworks to promote a more comprehensive understanding of discrimination since women are diverse. In combining the data, examples and the theory, what the paper provides is a process by which women on the periphery can be included in the society and be empowered. Fundamentally, this paper is a provocation for a new, expansive understanding of gender justice, one that honours survival and which tears down the structures that hinder women's flourishing, no matter who they are.

Asst. Professor, Lakhimpur Commerce College

KEYWORDS: Intersectionality, Women's Empowerment, Feminism, Dalit Women, Gender Justice, Marginalization, Caste Discrimination, Social Equity, Inclusive Feminism, Legal Frameworks, Gender Inequality, Human Rights, Patriarchy, Systemic Oppression, Diversity in Feminism.

INTRODUCTION

Among rising discursive changes in the feminist paradigm, the concept of intersectionality that indicates that women experience oppression and privilege at the interaction of various categories is noteworthy. The traditional feminism which primarily originated from the standpoint of white, middle-aged Western women has been accused of erasing women of colour, lower class women, and women of the third world. This has resulted in the emergence of this intersectional framework that challenges these gaps in an important way noting that gender inequality cannot be understood in isolation from colour, class, caste, sexual orientation, disability, and immigration status. Recognizing that Black women in the United States had different forms of oppression from the more common identikit racist sexist male[1], the term intersectionality was first proposed by Kimberlé Crenshaw in 1989. In her path breaking research, Crenshaw focused on the issues which prove that black women, and other women of colour in general, are in a different position than white women or black men and their oppression cannot be explained solely by racism or sexism. Intersectionality gave information on how different types of discrimination act in synergy to multiply the effect of each other making individuals' experiences of the world distinctive. For instance, a Black woman experiences racism and sexism at the same time – two dissimilar types of prejudice are not cumulative because they influence and shape a unique world for the woman. Intersectionality helps to draw awareness to the point that not all women's experiences are similar. This idea of a collective distinct womanhood is less and less tenable to today's feminist thinkers because women's experience is

[1]*Destine, ShanedaL The importance of intersectionality in evaluating the surveillance and protest politics of the Movement for Black Lives (M4BL). "Research Handbook on Law, Movements and Social Change. Edward Elgar Publishing, 2023.254-267.*

so dependent upon the social, economic, and cultural environments within which they exist and act. Women from marginalized communities —whether they are Dalit women in India, Black women in the U.S., indigenous women in Latin America, or refugee women in Europe—face unique systems of oppression. These women are often excluded from main stream feminist movements that focus predominantly on the struggles of white, middle-class women, leaving their voices unheard and their experiences in validated.

The feminist call for change for gender equality must then be defined differently especially given the fact that discrimination is not a single entity. Unlike mainstream feminism, inter- sectional one stresses that women cannot exist outside the intersections of social relations which are based on gender, race, caste, class, religion, and other factors. Gender in equality does not exist in isolation from other types of injustice: the challenge of intersectionality must always be borne in mind if meaningful progressive change is to be pursued.

Especially true in countries like India where one has to deal with issues of caste, class, religion and gender which complicate each other and it is in this socio-politically charged milieu that intersectionality has emerged as an important tool for analysis of women's experiences. Taking the example of Dalit women rape becomes an even worst form of oppression since it happens with the back drop of casteism. Where such women are found, main stream feminist movements do not adequately speak for these or address the problems they encounter advocating the need for a more diverse feminism. This paper aims at discussing the meaning of intersectionality in women's movements today, in the global and in the Indian context. This research hence in tends to empower a comprehensive understanding how women in socially disadvantaged groups experience multiple oppressions and thus identify the need for a feminism perspective in a complex manner.

Main Objective of the Paper: To understand the multiple oppressions faced by women of all caste, class and religion along with plight of the Dalit, Tribal and Muslim women by relating the issue in question to their past, present and future that typically remains ignored in mainstream feminism.

I. UNDERSTANDING INTERSECTIONALITY

A. Defining Intersectionality

Intersectionality in its simplest definition is a theory used to describe how different dimensions work together to produce forms of oppression or privileges based on gender, racial or ethnic origin, class, sexual orientation and disability. Otherwise, the term was developed by Kimberlé Crenshaw in 1989 as a tool for describing the plight of Black women in the United States. Crenshaw argues that although black women suffer discrimination in according to gender as well as in accordance to race, the black women suffer a fate that cannot be explained by either sexism or racism singly[2]; it is only when two aspects are taken into consideration together. Crenshaw's work was mainly an attempt to illustrate why the movements of the time – feminism and anti-racism were inadequate for Black women because both of these movements were created based on the white women's and Black men's experiences, respectively. Intersectionality then means that people request that were imagine the ways in which identity categories might be more connected. It makes it easier to understand why two individuals, a Dalit woman from India, a trans black person from America, or disabled refugee woman from Europe may experience something more than discriminated by both their identities but in differing ways than an individual from a single oppressed group.

Movements were created based on the white women's and Black men's experiences, respectively. Intersectionality then means that people request that we reimagine the ways in which identity categories might be more connected. It makes it easier to understand why two individuals, a Dalit woman from India, a trans black person from America, or disabled refugee woman from Europe may experience something more than discriminated by both their identities but in differing ways than an individual from a single oppressed group. Instead of perceiving oppression as a total of separate discrimination types (racism, sexism, etc.), intersectionality shows that oppression acts in a

[2]Crenshaw, Kimberlé Williams."Mapping the margins: Intersectionality ,identity politics ,and violence againstwomenofcolor."*Thepublicnatureofprivateviolence*.Routledge,2013.93-118.

multifaceted pattern, so a woman of colour needs to consider multiple aspects at once[3]. As a practical concept, intersectionality is not just a framework for analyzing discrimination, but one for recognizing and finding how to redress the complex forms of power that oppress and disadvantage. For instance, racism experienced by a working Muslim female in France or gender violence will in no way be same as that endured by a middle-class white female just experiencing sexism only. The compounded discrimination faced by the Muslim woman must be understood as a unique form of oppression that cannot be fully captured by focusing only on race or gender.

B. INTERSECTIONALITY AND FEMINISM

The social revolution of women and the gender equality fighting theories has for long time been championed by feminisms The main criticism that has been made concerning youthful feminisms is that they have been more sympathetic towards the challenges facing the White, middle-aged women. In the past, the feminism movement has been dominant in the western countries where women of colour, labour or immigrant women and women of colour and other menial groups where suppressed. More of this critique was seen during second wave of feminism (1960-1980) where aside from issues like sexual freedom and fertility control, other issues affecting women of colour and those from the working order powers were deemed unimportant. Another strong criticism which was leveled at second wave feminism was of the idea that all women's lives are definable by sameness[4]. This approach failed to account for how women of different racial, cultural, and economical status experience oppression in different manner. For example, whereas white feminists were probably coming out strongly for such demands as wage equality or reproductive rights, women of colour and especially Black and Latina women, were struggling with real-life oppressions from racism, sexism and classism, let alone trying to find the time to be getting organised[1]. Thus, for

[3]McCall,Leslie."Thecomplexityofintersectionality."*Signs:Journalofwomenincultureandsociety*30.3 (2005):1771-1800.

[4]Gordon,Linda."'Intersectionality',SocialistFeminismandContemporaryActivism:Musingsbya Second-WaveSocialistFeminist."*Gender&History*28.2(2016):340-357.

example, many Black women noted that the proponents of feminism disregarded the race aspect of their oppression. As for the anti-racism movements, these same struggled to pay attention to how the gender played out within the black females. Intersectional feminism came to existence as a result of these limitations in a way to addressing the issue of gender and inequality5. It also demands that all the sexist changes that are to be made must inevitably meet the concerns of all cultures of women, including black women, the poor women, immigrant women, lesbian women, bisexual women, and women with disabilities. Intersectional feminism therefore embraces the man oeuvre of female emancipation without considering a number of oppression interfaces functioning within the society.

An important case to talk about is the **#MeToo movement** that started in 2017.As started the **#MeToo movement** as a reaction to multiple cases of sexual harassment and assault by powerful men, it is clear that is an intersectional movement when women of colour started to speak up[3]. Although white women explained how they were sexually harassed within the movement and the rest of society, lesbian Black, Latina, and Indigenous women experienced these forms of violence in addition to racism with in both the feminist movement and the wider community. This process shed light on the fact that women of colour, from different culture and social class might have entirely different experience. Basically, intersectionality in this case made sure that the experience of the subordinate women could not be sidelined in the bigger fight for women, this gave them a voice and recognition within a fight that was deemed to be bigger in the fight for women.

II. GLOBAL IMPLICATIONS OF INTERSECTIONALITY IN FEMINISM

A. INTERSECTIONALITY AND GLOBAL FEMINIST MOVEMENTS

[5]Rosette, Ashleigh Shelby, et al." Intersectionality: Connecting experiences of gender with raceat Work. "*Research in Organizational Behavior*38 (2018):1-22.
[6]Carastathis. Anna. "The concept of intersectionality "*Philosophy compass*9.5(2014): 304-314.
[7]Leung, Rebecca,and Robert Williams, "#Me Too and intersectionaly: An examination of the #Me Too Movement through the R.Kelly scandal."*Journal of Communication Inquiry*43.4(2019):349-371

Feminism all around the world has been through several phases and each phase was a reaction to what was happening to women in society and politics at any one time. The first phase of feminism (late nineteenth to early twentieth century) most specifically looked at gaining women's civil liberties, voting rights etc., however it was primarily a white middle class women in terms of race and nationality from USA and Europe. The second wave that lasted from 1960s to 1980s broadened the base to areas like reproductive rights, sexual revolution, or discrimination at the work place among other. But women of colour, native women, immigrant women dismissed second wave feminism as not representing their oppression and experiences. Especially women of colour in the United States spoke about their concern stating that oppression was not only gendered but also racial and economic. These concerns were left out of those mainstream feminist movements, which ignited the development of Black feminism as well as Chicana feminism[1], which made the issues that women of colour, and who are painful in this interaction of race, class, and gender. The third wave (1990's to present) started with the views that it is desirable, logical, legal, and possible to advance women at work and at home across the multiple dimensions of race, class, sexuality, and ability. The third wave was for the recognition of the fact that women are not uniform in their experiences and that global feminism needed to include three main areas, gender violence, economic disenfranchisement and climate justice[2].

A popular intersectional global feminism is the Black Lives Matter (BLM) movement[3]. Although started with the protest against the police brutalities against Black men, BLM later involved voices of the Black women, Black LGBTQ, Black Trans individuals. These experiences were included by BLM into the international fight against racism as they realized that race discrimination manifests in different ways for Black people with different characteristics. For instance, Black women are violated through a certain type of violence that both racist and sexist in nature, such as Black women experiences, should be recognized and discussed within the framework of racially-defined justice.

B . INTERSECTIONALITY AND GENDER PAY GAPS

This however is not world-wide even with the existence of gender pay gap but it is not like all women are paid less than their male counterparts. Specifically, women of colour, lesbian, bisexual and other queer identified women, Indigenous women and women from low-income households are paid less than White women. Thus, Black women in the USA are paid 64% of What white men are paid; and Latin a woman are paid even less. In the same manner, Indigenous women as well as the transgender women tend statistically to earn less than the white men and even face higher levels of pay disparities because of the multiple discriminations they endure. The existence of such disparities is explained by the intersectionality framework. Pervasive factors of prejudice based upon race, social class, gender and sexuality perpetuate economic disparity and further hinder conditions for parity at work. For example, it is not uncommon for a Black woman to experience racism in access to employment opportunities or racial discrimination in being offered employment while in employment she may experience sexual discrimination or sexual harassment and limited visibility or promotion to better paid positions. Transgender women may be discriminated based on their gender identity and lesbians from lower income earner families or anyone from a lower-class background may struggle hard to get a decent job[1]. The intersectionality framework calls for a more nuanced approach to addressing the gender pay gap, one that takes in to account not only gender but also for race, sexual orientation, and disability status.

III. INTERSECTIONALITY AND FEMINISM IN INDIA

Within Indian context, it is possible to discover multiple intersections of Gender with Caste and Class, religion, and geography. Experience of women in India cannot be reduced to one plane of gender oppression; rather there are multiple vectors that intersect each other. The basis of this intersection is the idea that the abuse of women cannot be disentangled from other kinds of injustice. That is how it is possible to understand the combined forms of oppression, which Indian women experience, primarily those, who are representatives of the culturally and socially inferior groups. It will valuable if the intersectionality in India can be explained by using the case of Dalit women[2]. Like any patriarchal society, Dalit women are denied their basic right sand they also suffer violence from both men and women, but apart from this they suffer violence base on their caste status. The Indian caste system is one of the oldest and continues to be among the most saturated and clear hierarchical systems wherever they are located at the bottom of these society scale. This matter complicates the oppression of Dalit women through both caste and gender— something that current separatist discourses, whether feminist or anti-caste, fail to fully encompass. As a result, Dalit women are subjected to various forms of humiliation, ranging from rape to domestic violence. Since what happens to them is not recognized by society [1].

For instance, as stated earlier, the NCRB estimates show that more than 6,000 Dalit women were raped in India alone in 2020; therefore, this is Selected group is most vulnerable to GBV. But the violence these women experience is not only gendered, but also the caste violence in combination with untouchability practices still existing in most regions of India. For Dalit women, the violence they experience is compounded by their social and economic status, making their plight even more in visible. Despite existing legal protections, such as the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act (1989), Dalit women often find it impossible to access justice[2]. Biases within law enforcement agencies, where many officers come from higher caste backgrounds, result in cases being under reported or dismissed outright. For instance, Police often fail to register cases or intimidate the victims into silence withdrawing complaints, reflecting the deep-seated caste prejudices within India's legal system.

On the same note of gender imperialism, tribal women of India are two ways marginalized by their gender and tribal location and this makes the ordeal worse by the geographical isolation. Folk women again suffer dual evils of gender discrimination and caste discrimination as the tribal women are being regarded as untouchable safter the SC sand STs. These women have no access to important aspects of human life amenities like education, health care, and job opportunity. Their plight is even worse in the rural regions since any opportunities are costly in terms of their gender and tribal status. Continued exclusion of Indigenous women from freedoms and justice is another way in which they face multiple forms of oppression due to both gender and Indigeneity The second major example of intersectionality present in Indian context is the position of Muslim women whereby they are victims of both religion and discrimination[3]. Being Indian minority and women, they are trapped at the intersection of gender oppression and religious oppression although both are functions of socio-cultural and religious dynamics. Gender based violence women in Islam include in domestic abuse, child marriage, etc are prevalent and therefore their experience of gender opportunist violence is conditioned by Islamic and Arabo-Persian cultures. For example, practices like Triple Talaq, where a husband can unilaterally divorce his wife by uttering "Talaq" three times, were historically used to further disenfranchise Muslim women.

The Indian government's ban on Triple Talaq in 2019 was acritical step toward ensuring gender justice within Muslim communities. However, the debate surrounding this law also highlighted the complex relationship between religious autonomy and gender equality. For some, the law was seen as an infringement on the rights of Muslim communities to govern their personal matters according to their religious practices. Yet for others, it was a necessary step toward ensuring that Muslim women could live free from the threat of arbitrary divorce and the social and financial hardships it caused. This debate underscores the tension between feminist efforts to secure gender equality and the respect for religious freedoms, highlighting how intersectionality is central to understanding the ways in which religion and gender can combine to create unique forms of oppression for women[4]. This case also clearly shows how the battle for prerogatives and gender equality is between feminists and supporters of religious freedom and cultural rights, an inherent lesson of intersectionality or how gender and religion may act in concert to oppress the rights of women. A large percentage of working women are employed with informal sector because the Indian economies depend largely on the informal sector. These women are generally locked out from labour policies that govern employment and income and hence they lack adequate rights that protect them from mistreatment and exploitation. For example, domestic workers—who are predominantly women from rural or economically marginalized communities[5]—work long hours for meagre wages and are often subjected to verbal, physical, and sexual abuse by their employers. Despite the enactment of laws such as the Sexual Harassment of Women at Workplace Act (2013), many women in the informal sector continue to face systemic violence and discrimination due to the in visibility of their work[6].The gender pay gap further underscores the intersectionality of class and gender in India. According to various reports, Indian women earn only about 20-30% less than their male counterparts for the same work, with the pay gap being wider for women from marginalized communities. Though evaluated by the Gender Equality Index, the problem of wage gap remains to be an essential obstacle on women's way to the labour market, their self- reliance and opportunities[7]. In spite of having many laws that legally protect women – be it Protection of Women from Domestic Violence Act, 2005[8], Sexual Harassment of Women at Workplace Act, 2013, Equal Remuneration Act,1976[9]; the Indian legal systems rather the legal frameworks have failed to address gender, class and caste issues adequately. Although these laws have played some role in supporting women's rights, these laws do not capture these compounded and special types of oppression that women in the marginalized groups experience. For instance, since the Indian laws recognize the rights of the Dalit and tribal women, and other unfortunate women who become victim soft various for most violence, these unfortunate women do not access justice since the laws discriminated in the police stations and courts. Consequently, the experience of women in India is determined by multiple factors that are not fully captured by a narrow understanding of gender. Indian feminism has to recognize and combat caste, class, religious and geographic stratification of womanhood. It demonstrated that internal stratification common to the feminist movement was dangerous because it limited the involvement of minority females.

CONCLUSION

Women of India have multi-layered matrices of oppression which means that the gender oppression of women is realized not on a clean slate but through intersectionality of caste, class, religion, etc. It enables us to move away from the simple and isolated understanding of gender oppression to look at the interrelated forms of discrimination with which the oppressed women in Indian society have to contend with. A note of caution is necessary here, declaring this complexity not only for getting deeper into the real-life suffering of those women but also for developing the appropriate political program and campaigning. Understanding the various forms of oppression, it becomes evident that feminism in India cannot be a gate kept movement or a single identity.

Patriarchal domination, casteism, economic oppression and communalism which operate to dominate the lives of Dalit women, tribal women, Muslim women and working-class women. The oppression that these women face in their everyday is determined by their different distinct characteristics. The same can be said for tribal women whose several barriers come in the form of gender and the tribal background as well as Muslim women who experience both gender exclusion and religious discriminations. These women exist in environments in which their voices barely find any representation and their plight kept out of public/viral discourse. Despite the fact that these oppressions are systemic, comprehensive and saturate our milieu, these women have been at the vanguard waging resistance. Regardless of how they operate, from grassroots campaigns to fighting for change at the legal and social levels in which they are oppressed, they have struggled and been strong despite the pervasive and intentional violence they end up enduring. Dalit Panthers, Adivasi agitations, Muslim women's rights protests have come to present the complexity of those women in question. These certain movements have taken time to caution the world that oppression should be viewed separately and how they combine to form sorts of oppression that the oppressed individuals go through. However, the laws of India provide some legal rights to women but most fail to recognize the multidimensional injustice system. Discrimination in the police, courts and political institutions manifests itself in such manner that such woman is not compensated. There is no check within the legal structures thus they end up creating a culture of impunity that continues to oppress them. The feminist movement in India, therefore, has to go beyond merely speaking for gender equality only. It must urge justice which is sensitive towards women, and at the same time conscious about Caste and class divisions and region too. Now, Indian feminism must also be, expanded which should include the challenges that Dalit women, tribal women, and women from the working-class face and these voices are not silenced. Economic literacy is also an essential aspect of this broader feminist project. such women, particularly the young ones from vulnerable subgroups, including those in the informal employment sector, are subject to severe economic exploitation. Example is making of domestic workers, agricultural laborers, women working in constructions; they mostly never get any labour rights, they are always being threatened with rape and denied the right to earning an economic wage.

When employing the intersectional lens, we are able to design a society and world that will be fair to all women, and this means that all women will be empowered. Real feminism in India is for all, for the poor women, the indigenous women, the Muslim women and the Dalit women who have least been heard in this patriarchal society. This transition to inclusive feminisms cannot be without mindfulness, vigilance, and tireless efforts from and within communities, NGOs, institutions, governments and policies; it cannot happen without an unyielding position to destroy obstacles to women's emancipation.

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MANAGING E-RESOURCES IN ACADEMIC LIBRARIES: A CASE STUDY OF FIVE COLLEGES IN LAKHIMPUR DISTRICT, ASSAM

RUPAM HAZARIKA,
JYOTISHMITA BORAH

ABSTRACT

With the rapid growth of globalization and Information Technology, the availability of up-to-date information in electronic formats has transformed academic libraries. E-resources such as e-books, e-journals, and databases now play a crucial role in supporting education and research. The integration of ICT has expanded library services beyond print, making digital access essential. This shift has led to the emergence of E-Resource Management (ERM), focusing on the organization and maintenance of electronic resources. This paper explores the key challenges and practices of ERM in the selected five college libraries of Lakhimpur District, Assam, highlighting the evolving processes involved in managing digital content effectively.

KEY WORD- E-resource, Academic Library, Lakhimpur

Librarian, LTK College, Assam
Asst. Professor, Lakhimpur Commerce College

1. INTRODUCTION

Knowledge has become a vital, constantly changing resource that permeates every discipline and aspect of modern life in the unprecedented era of information abundance that the 21st century has brought about. Libraries and information centers have been drastically altered by the digital revolution, which has forced them to adjust to the quick changes in information technology (IT). Libraries today are no longer limited to traditional roles; instead, they use state-of-the-art IT solutions to create self-governing systems and cutting-edge tools that give users unprecedented power.

Addressing the particular difficulties faced by knowledge repositories, library management has become a crucial subfield of institutional administration in this changing environment. Library administration now involves more complex responsibilities like safeguarding intellectual freedom and securing long-term support in an increasingly digital world, in addition to more conventional administrative tasks like staff coordination and resource allocation. Libraries of all sizes are rapidly embracing digital collections, but this trend does not herald the demise of print materials. Instead, a hybrid approach has become popular, whereby businesses carefully merge digital and physical resources to meet a variety of user needs. Acquisition trends represent this change, with a growing emphasis on digital journals, publications, and indexing services.

In libraries, e-resource management refers to the effective arrangement, accessibility, and upkeep of electronic resources, including databases, digital archives, e-books, and e-journals. It involves activities such as resource selection and acquisition, licensing contracts, access verification, usage monitoring, and long-term preservation. In order to simplify these procedures, contemporary tools such as discovery services and ERM (Electronic Resource Management) systems are essential.

A Y Kenchakkanavar , explaine "An electronic resource is defined as a resource which requires computer access or any electronic product that delivers a collection of data, be it referring to full text bases, electronic journals, image collections, other multimedia products and numerical, graphical or time based, as a commercially available title that has been published with an aim to being marketed." (Kenchakkanavar, A. Y. 2014)

In this research paper we will study out E-Resource Management in Academic Library: A study With Special Reference to Five Selected College Libraries of Lakhimpur District, Assam.

2. E-RESOURCE; ITS COMPONENTS AND IMPORTANCE

Electronic resources, or e-resources, refer to digital products that provide access to information in various formats—such as full-text documents, e-journals, image collections, multimedia content, as well as numerical, graphical, or time-based data. These resources are now widely available across nearly every field of knowledge and are increasingly used by libraries and information centers.

With the growing demand for instant and broad access to information, traditional libraries are evolving into modern information hubs. This transformation is largely driven by the inclusion of e-resources in their collections. To meet the diverse needs of users, libraries are actively adopting and expanding their range of e-resources as part of their collection development strategies.

2.1 COMPONENTS OF E-RESOURCES

2.1.1 E-Databases

E-databases include collections such as periodical indexes and abstracts like CAB, LISA, METADOX, WIPS, ACS, and ASTM Standards. They also cover journals, directories related to communication and mass media, encyclopedias, dictionaries, and other essential reference tools.

2.1.2 E-Journals

E-journals provide access to a wide range of academic content. In the field of Library and Information Science, users can access journals through the UGC Infonet Consortium. Additionally, many open-access e-journals are freely available online.

2.1.3 E-Magazines

Magazines are now offered in digital formats, such as Zinio, providing the same content as the print versions at comparable prices. This allows readers to enjoy magazines conveniently on their devices.

2.1.4 E-News

Electronic news sources include platforms like LexisNexis and Factiva, offering access to a wide range of local, national, and international newspapers and news updates.

2.1.5 Data/GIS

These resources include numeric and geospatial data, suitable for users who work with statistical or Geographic Information System (GIS) software for research, planning, and analysis.

2.2 IMPORTANCE OF E-RESOURCES

E-resources play a vital role in academic libraries by offering quick and efficient access to the information users need. In today's digital age, web-based e-resources have become essential tools for students, researchers, and faculty. Many academic libraries now subscribe to consortium-based e-resources to meet the growing demands of their users. Alongside these subscriptions, a wide range of free, open-access e-resources are also available across all subject areas.

Familiarity with and regular use of electronic information resources are key to supporting academic success and research growth. E-resources are especially important because:

- Users can access the information they need within minutes, right from their desktop or mobile device.
- They offer a vast and organized collection of information, often much larger than print collections.
- E-resources are generally more cost-effective than printed materials. In addition, e-resources offer global accessibility, ease of use, interactive features like hyperlinks, and the convenience of 24/7 availability—making them an indispensable part of modern academic life.

3. OPEN SOURCE E-RESOURCE MANAGEMENT SOFTWARE

Open-source software plays a vital role in managing e-resources in modern libraries. These tools are not only cost-effective but also offer the flexibility to be customized according to the specific needs of an institution. Below are some of the most popular and widely used open-source e-resource management systems:

3.1 DSpace

DSpace is widely adopted open-source repository software developed as a joint initiative by the Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard (HP) Labs. It is designed to capture, store, manage, and preserve digital content, making it ideal for academic institutions. One of the key advantages of DSpace is that it can be customized to fit the needs of different organizations.

3.2 E Prints

E Prints is one of the earliest and most popular open-source software platforms for building open-access repositories. Developed by the University of Southampton in the UK, it allows for easy installation and management of scholarly content. EPrints is known for its user-friendly interface and flexibility in handling a variety of digital content types.

3.3 Koha

Koha is the first fully-featured open-source Integrated Library System (ILS), originally developed in New Zealand in 1999. It is used by libraries of all sizes around the world—academic, public, and special libraries alike. Koha supports standard library protocols and runs on multiple platforms, making it a reliable and adaptable choice for managing both print and electronic resources.

3.4 Greenstone

Greenstone is open-source digital library software developed by the New Zealand Digital Library Project at the University of Waikato. It is particularly useful for building digital collections of various formats including text, images, audio, and video. Greenstone is used widely by educational institutions and cultural organizations, especially in developing countries, due to its multilingual support and easy customization.

3.5 Invenio

Invenio is a free and open-source software framework developed by CERN for managing large-scale digital repositories. It is highly scalable and supports advanced features like metadata harvesting, indexing, and multilingual search. Invenio is ideal for research institutions and universities that need to manage complex and voluminous digital content.

3.6 VuFind

VuFind is an open-source library resource portal designed and developed by Villanova University. It allows users to search and browse through all of a library's resources—catalog records, digital library items, institutional repositories, and more—through a single interface. VuFind is highly customizable and offers features like faceted search, tagging, and user-generated content.

4. MANAGEMENT OF E-RESOURCES IN COLLEGE LIBRARY

Managing e-resources in a college library is a challenging but essential task in today's digital era. As libraries continue to see rapid growth in both printed and electronic content, library professionals are required to develop new skills and adopt specialized tools to effectively organize and maintain digital collections. With the increasing reliance on online education, research, and remote access, the efficient management of e-resources is more important than ever.

As e-resources grow in volume and complexity, their management goes beyond traditional library practices. It involves selecting, acquiring, organizing, indexing, storing, and ensuring smooth retrieval of digital content to meet the needs of students, faculty, and researchers.

4.1 Selection and Acquisition

The emergence of the Internet—especially the World Wide Web—has led to an explosion in the availability of full-text online resources. Librarians play a key role in identifying credible, relevant, and useful e-resources based on user needs and institutional goals. Selection is usually guided by a collection development policy. Resources may be acquired directly in digital format, or in some cases, printed materials are digitized and converted into machine-readable formats for wider access and preservation.

4.2 Organization and Metadata Creation

Unlike physical books, e-resources require proper metadata tagging and classification to ensure discoverability. Accurate metadata allows users to search and locate digital content quickly. Organizing e-resources based on subject, format, and user demand improves access and usability.

4.3 Indexing

Indexing is essential to make the content searchable through platforms like Online Public Access Catalog (OPAC) or integrated discovery systems. Proper indexing ensures that users can find the right resources through simple keyword or advanced searches.

4.4 Storage

Digital resources require secure, scalable, and reliable storage solutions. This often includes cloud storage, institutional repositories, or digital library systems that can handle large volumes of multimedia content. Backup systems and disaster recovery plans are also important to safeguard data against loss.

4.5 Access and Retrieval

Effective retrieval of e-resources is at the core of user satisfaction. Libraries must provide user-friendly interfaces and search tools to help students and faculty easily access the information they need. Access can be made available through library portals, learning management systems (LMS), or federated search tools that allow access to multiple databases from a single platform.

4.6 Usage Monitoring and License Management

E-resources often come with usage restrictions and licensing agreements. Library staff must monitor access, ensure compliance with licensing terms, and analyze usage data to evaluate resource effectiveness. This data helps in making future subscription or renewal decisions.

4.7 User Training and Support

Not all users are familiar with digital tools. Libraries should offer orientation programs, training sessions, and help guides to educate users on how to access and utilize e-resources effectively. Providing remote support has also become a key responsibility.

5. OBJECTIVES OF THE STUDY

To know the collection of different types of electronic resources in college library of Lakhimpur District.

To know the management of electronic resources.

6. METHODOLOGY

The selected college libraries in Lakhimpur district were visited to gather information about the current availability and management of e-resources. Data collection involved direct interviews and interactions with librarians, library staff, and regular users of these college libraries. These conversations provided valuable insights into how e-resources are accessed, managed, and utilized in the academic environment..

7. LIST OF SELECTED COLLEGE LIBRARIES IN LAKHIMPUR DISTRICT

Bihpuria College,

Dhakuakhana College

Harhi College

North Bank College

Nowboicha College

8. FINDINGS OF THE STUDY:

a. Library Collection :

Table 1: Library Collection (Print material)

Name of the Colleges	Print Material									
	Total Book Collection	Text Books	References	Magazines	Journals	Bound Vol	Maps	Reports	Theses	Others
Bihpuria College	18836	9700	668	5	5	300	0	0	**0**	0
Dhakuakha College	18700	1420	7438	5	8	0	0	0	**0**	0
Harhi College	24500	1245	1690	8	8	356	8	0	0	0
North Bank College	9565	8830	200	4	135	0	0	0	0	0
Nowboicha college	11500	4500	650	5	11	0	0	0	0	0

Table 2:Library Collection (Non-Print Material)

Name of the Colleges	Non Print Material						
	E-Books	E-Journals	CD/ DVD/ VCR	Micro film	Micro Fiche	Data base	Others
Bihpuria College	>10000	>5000	0	0	0	0	0
Dhakuakha College	>10000	>6000	0	0	0	0	0
Harhi College	>50000	>7000	34	0	0	0	0
North Bank College	>10000	>6000	20	0	0	0	0
Nowboicha College	>10000	>5000		**0**	**0**		**0**

Table 3- Online access

	N-List	ONOS	DLI
Bihpuria College	✗	✓	✓
Dhakuakhana college	✓	✓	✓
Harhi College	✓	✓	✓
North Bank College	✓	✓	✓
Nowboicha College	✓	✓	✓

Table 4. – Internet access medium

	WiFi	LAN
Bihpuria College	✓	✗
Dhakuakhana college	✓	✗
Harhi College	✓	✓
North Bank College	✓	✓
Nowboicha College	✓	✗

Table 5- faculty participation access e-resource

	Regularly	some time	rarely
Bihpuria College	✓		
Dhakuakhana college	✓		
Harhi College			✓
North Bank College	✓		
Nowboicha College		✓	

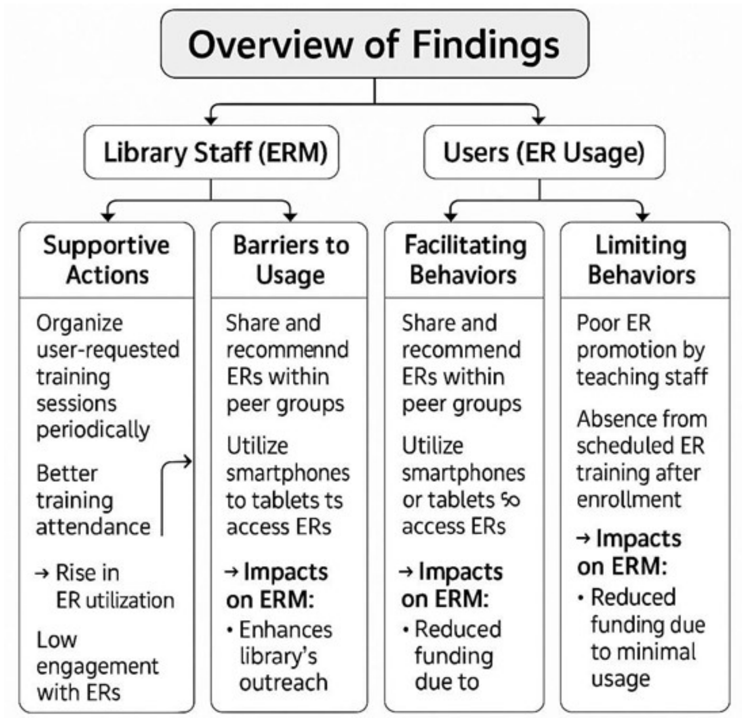
Table 6 - faculty participation access e-resource

	Daily	Often	Rarely
Bihpuria College		✓	
Dhakuakhana College		✓	
Harhi College			✓
North Bank College		✓	
Nowboicha college			✓

b. Library Finance: Librarian's response on facing Financial Problem for management of E-Resources in College Library under Lakhimpur District.

Sl.no	Name of the college Library	(Librarian's Response) Yes/No
1	Bihpuria College	No
2	Dakuwkhana college	No
3	Harhi College	No
4	North Bank College	No
5	Nowboicha college	No

8. FINDINGS



9. CONCLUSION

The study highlights the complex interplay between library staff (responsible for E-Resource Management or ERM) and users (students and faculty) in determining the effective utilization of electronic resources (ERs) in college libraries of Lakhimpur Distict of Assam. The findings suggest that while supportive actions such as user-requested training and active engagement initiatives by library staff can significantly enhance ER utilization, several barriers and limiting behaviors continue to restrict their full potential.

Library staff plays a proactive role in organizing training sessions and promoting ERs, but issues such as inconsistent promotion by faculty, lack of post-enrollment orientation, and technological barriers (e.g., access via smart phones and tablets) still limit user engagement. Peer recommendation and informal sharing of e-resources among students were found to be one of the most effective facilitating behaviors, highlighting the importance of community-driven awareness.

A critical insight from the study is the **interdependency** between library staff and users: neither side alone can ensure successful ERM. Better coordination, continued training, improved infrastructure, and stronger faculty involvement are necessary for optimizing digital resource use. Inadequate usage not only undermines academic growth but also results in reduced funding and underutilization of library investments.

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CONTRIBUTION TO THE FERN DIVERSITY OF SWANG RESERVE FOREST OF ASSAM

BASISTHA KALITA

ABSTRACT

Pteridophytes, the higher cryptogams which are also known as lower vascular plants, dominated the world vegetation about 280-230 million years ago. In course of time they are gradually replaced by seed bearing vascular plants. Despite of such kind of conversion they are still contributing a prominent part of the present day vegetation of the world. There are about 12000 species of Pteridophyte under 300 genera in the world. In India more than 1000 fern species under 191 genera and 67 families were reported (Dixit, 1984) of which 47 are endemic to India. Since ancient time different species of Pteridophytes are being used by different communities in different part of the world in medicinal and nutritional purpose. In the present work an attempt has been made to make a list of Pteridophytic species found in Swang Reserve forest of Assam, India. Swang Reserve forest is located under the Barhampur Tehsil in Nagaon district of Assam with an area of 44.06 squares Kilometre. The forest also houses the famous Champawati waterfall which is also a popular picnic spot in the area. The type of the forest is evergreen rain forest and is

Department of Botany, Kaliabor College, Kuwaritol , Nagaon, Assam, India, PIN 782137

very rich in biodiversity particularly plant diversity. The preliminary survey of the ferns of the area reveals the presence of 53 species under 41 genera of Pteridophyte of which some are very rare. The interior part of the forest is dominated by Cyathea and Angiopteris species while the peripheral area is dominated by other ferns like Lygodium, Dryopteris, Pteris etc.

KEY WORDS: Fern, Pteridophyte, Swang.

1. INTRODUCTION:

Pteridophytes are considered as the earliest vascular plants and supposed to be originated about 400 million years ago in Silurian period of Palaeozoic era. This group of plants dominated the vegetation of earth during Devonian and Carboniferous periods of Paleozoic era. Though these are now replaced by well developed seed bearing vascular plants, yet they contribute and constitute a large part of the world vegetation. Since time immemorial Pteridophytes are being used in different purposes by different ethnic communities of the world. Some species of Pteridophytes like Lycopodium, selaginella, Adiantum, Pteris, Angiopteris etc are used for beautification of residential as well as official complexes. Different species of Lycopodium are used as dry flower in the drawing rooms. Many species of Adiantum, Selaginella, Dryopteris etc are planted in earthen tab and used as decorative plants. Apart from the ornamental aspects Pteridophytes bear some other importance too. Some of the Pteridophytic species are edible and found to be a good source of starch, greens and additives. Some ferns are consumed as a vegetable and leaves; young fronds, stems and rhizomes of some species are also consumed to treat many diseases (Keller and Prance 2015). Some species of Pteridophytes are used to get relive from stomach pains, fever, colds and headaches, treatments of boil, ulcers and wounds. Some Pteridophytes are also used in the time of Menstruation, childbirth and as contraceptive. 21 species of Pteridophytes were reported to use to treat much disease by local communities of India (Kartik et al, 2022). A large number of the ferns are also used as ornamental plants for interior as well as outdoor decoration.

Pteridophytic species like Azolla, Salvinia are also used as bio-fertilizer in rice fields.

There are about 12000 species of Pteridophytes under 300 genera all over the world. In India more approximately 1000 species of Pteridophytes under 191 genera are found (Dixit,1984; Dixit and Vora, 1984). Out of the 1000 species present in India 47 species are endemic to India (Jenkins, 2008). Being one of the hot-spots of biodiversity, Assam also rich in Pteridophytic diversity. But there was a few systematic studies about the ferns and fern allies and the only account of the flora of the state (Flora of Assam, by Kanjilal et al) did not deal with this group of plants. Of late some workers have listed the orchids of some particular area of the state. Total 60 species under 36 genera were observed in Nazira subdivision of Sibsagar District of Assam (Das and Nath, 2012). Total 68 species were reported from Sibsagar district of Assam (Baruwati and Gogoi, 2013). From the Bongaigaon district of Assam 61 species of Pteridophytes were reported (Das and Sarkar, 2018).In Bherjan-Borajan-Padumoni Wild life Sanctuary of Assam 33 species belonging to 23 genera were listed (Borah and Barukial, 2021). It is found that the Pteridophytic vegetation in Assam is predominantly evergreen and shows a wide range of habitat variation. Terrestrial, epiphytic, climbers, lithophytes, aquatic-all types of Pteridophytes are found in this region. But due to the rapid urbanization ant changing climate pattern the fern diversity may be affected. So listing the fern diversity in different areas and adoption of conservation measure is utmost need of the present time.

In the present work an attempt has been made to make a list of the ferns of Swang reserve forest of Assam. Swang is a small reserve forest which houses the famous Champawati waterfalls and is a popular picnic spot under the Barhampur Tehsil of Nagaon district of Assam. The area of Swang reserve forest is approximately 44.06 squares kilometre. The type of the forest is evergreen rain forest and is very rich in biodiversity particularly plant diversity. In terms of the diversity of Fern and Fern allies Swang is very rich. A preliminary survey was carried out in Swang reserve forest for its fern diversity.

2. MATERIALS AND METHODS:

The present study on the ferns or Pteridophytes of Swang Reserve Forest is based on extensive survey and collection from the forests.

During collection in the field all the essential data were collected. The collection, pressing and preparation of herbarium specimens were done according to the recommended procedure (Jain and Rao, 1976) and are preserved at the herbarium of Kaliabor College, Nagaon, Assam.

Provisional Identification of the specimens was made with the help of available literature.

3. RESULT AND DISCUSSION:

A preliminary survey was carried out in Swang Reserve forest for its fern diversity. The survey reveals the presence of 53 species under 41 genera in the forests of Swang (Table-I). Out of the 51 species found in the forest *Angiopteris evecta Cyathea medullaris Pterist ensiformis* and *Pteris vitata* dominate the core region of the forest. The peripheral region is filled with species of *Dryopteris, Adiantum, Lygodium, Asplenium, Deparia, Christella, Athrium, Blechnm* etc.

Table- I: Fern diversity of Swang Reserve Forest

Sl. No	Name of the Species	Family
1	*Adiantum assamicam*. Nyar	Pteridaceae
2	*Adiantum phillipense* L.	Pteridaceae
3	*Angiopteris evecta* (Forst)Hoffm	Marattiaceae
4	*Asplenium nidus* L.	Aspleniaceae
5	*Asplenium scolopendrium* L.	Aspleniaceae
6	*Ampelopteris prolifera* Retz.	Thelypteridaceae
7	*Amphineuron esculantum* Retz.	Thelypteridaceae
8	*Athrium filix femina* L.	Athyriaceae
9	*Azolla Pinata* R.Br,	Salviniaceae
10	*Blechnum orientale* L.	Blechnaceae
11	*Christella dentate* (Forssk)Brownsey & Jermy.	Thelypteridaceae
12	*Ctenitopsis fuscipes* Wall. Ex Bedd.	Dryopteridaceae
13	*Cyathea medullaris* (G.Forst.)Bernh.	Cyatheaceae
14	*Deparia acrostichoides* (Sw.)M.Kato.	Aspleniaceae
15	*Dicranopteris linearis* var. Altisima (Burm. Fil)UNderw	Gleicheniaceae
16	*Diplazium esculantum* Retz.	Athyriaceae
17	*Diplazium muricatum* Mett.	Athyriaceae
18	*Drynaria quercifolia* L.	Polypodiaceae
19	D*rymoglossum heterophullu*m L	Pteridaceae

20	*Drymoglossum* piloselloids L.	Pteridaceae
21	*Dryopteris sparsa* Bush-Hm ex D' Don	Dryopteridaceae
22	*Dryopteris cycadina* (Franch. & Sav)C.Chr.	Dryopteridaceae
23	*Equisetum diffusum* D.don	Equisetaceae
24	*Gleichania volubilis* Jungh	Gleicheniaceae
25	*Helminthostachys zeylanica* (L.) Hook.	Ophyoglossaceae
26	*Lycopodium* clavetum L.	Lycopodiaceae
27	*Lygodium japonicum* (Thunb) Sw.	Lygodiaceae
28	*Lepisorous thunbergianus* (Kulf)	Polypodiaceae
29	*Lindsaea odorata* Rxb.	Lindsaceae
30	*Marsilea minuta* L.	Marseliaceae
31	*Macrothalipteris ornate* (Wall.ex Bedd) Ching	Thelypteridaceae
32	*Microsporium punctatum* L.	Mirioni mura (Ass.)
33	*Microsporium membranaceum* D.Don	Polypodiaceae
34	*Microlepia speluncae* (L.) Moore	Dennstaedtiaceae
35	*Nephrolepsis exaltata* (L.)Schott.	Nephrolepidaceae
36	*Ophioglossum reticulatum* L.	Ophyoglossaceae
37	*Platycerium bifarcatum* (Cav.)C.Chr.	Polypodiaceae
38	*Pteridium aquilinum* (L.)Cuhn.	Dennstaedtiaceae
39	*Pteris ensiformis* L.	Pteridaceae
40	*Pteris vittata* L.	Pteridaceae
41	*Pteris cretica* L.	Pteridaceae
42	*Pteris quadriaurita* Retz.	Pteridaceae
43	*Pyrrosia adnascens* Sw.	Polypodiaceae
44	*Pyrrosia varia* Kaulf.	Polypodiaceae
45	*Pyrrosia nummulariifolia* (Sw.)Ching	Polypodiaceae
46	*Salvinia cucullata* Roxb.	Salviniaceae
47	*Selaginella picta* (Griff)A.Braun ex Baker.	Selaginellaceae
48	*Selaginella* (Hook. Et Grev).	Selaginellaceae
49	*Sphenomeris chinensis* L.	Lindsaeacae
50	*Stenochlaena palustris* (Burm. F.)Bedd.	Blechnaceae
51	*Tecteria devexa* Kuntze.	Tectariaceae
52	*Tecteria variolosa* (Wall. Ex Hook.) C.Chr.	Tectariaceae
53	*Thelypteris kunthii* (Desv.)C.V. Morton.	Thelypteridaceae

Photographs of some Pteridophytes found in Swang Reserve Forest
Photo plate 1

Angiopteris evecta **(Forst)Hoffm**

Diplazium esculantum **Retz.**

Christella dentate **(Forssk)Brownsey & Jermy.**

Drynaria quercifolia **L.**

***Asplenium nidus* L.**

Pyrossia sp.

Pyrossia Sp.

***Lygodium japonicum* (Thunb) Sw.**

***Blechnum sp*.**

Dryopteris sp.

Dryopteris sp.

***Pteris ensiformis* L.**

***Pteridium aquilinum* (L.) Cuhn.**

***Tecteria sp*.**

***Adiantum assamicam* Nyar**

4. CONCLUSION:

Swang Reserve forest is very rich in biodiversity particularly in fern diversity. Though human interference has already started in the forest still comparatively the vegetation is not much destroyed? But if the human activities are allowed to continue, certainly a day will come when a sizeable number of plant species will lose their existence from the forest. The demand of the time is to make the people of the locality aware about the importance of vegetation in maintaining the healthy environment and to contribute towards the sustainability of humankind.

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LIBRARIES IN INDIA: BRIDGING TRADITION AND MODERN KNOWLEDGE THROUGH NDLI AND SWAYM

RUNJUN BARUAH
HIMADRI DEKA BURAGOHAIN
AKKID AHMED

ABSTRACT

This study explores the evolving role of libraries in India as they transition from traditional repositories of ancient texts to dynamic, digitally enabled centers of inclusive learning. Drawing from secondary sources and literature, the paper examines how libraries have adapted over time—preserving India's intellectual heritage through digitization while embracing modern technologies like integrated library management systems, digital archives, and online access platforms. Special attention is given to initiatives such as the National Digital Library of India (NDLI) and the National Mission on Libraries, which aim to modernize infrastructure and democratize knowledge access across socio-economic and regional divides.

The research highlights libraries' critical function in fostering educational development, digital literacy, and social empowerment—particularly in rural and marginalized communities. Libraries now serve diverse user groups, offering multilingual content, ICT tools, and inclusive services like Braille and audio resources. Through a combination of analysis and literature review, the study reveals that Indian libraries are becoming

Librarian, Lakhimpur Commerce College
Assistant Librarian , Lakhimpur Commerce College
Computer Teacher

transformative institutions that blend the wisdom of the past with the innovations of the present.

Ultimately, the paper suggests that for libraries to sustain this dual role effectively, further investment in technology, rural outreach, and staff capacity-building is essential. Libraries in India stand as key pillars in building an informed, inclusive, and culturally resilient knowledge society.

KEYWORDS - Indian libraries, Digital transformation, Knowledge preservation.

1. INTRODUCTION

India's libraries have always been more than mere storehouses of books—they are enduring symbols of the nation's intellectual evolution, cultural diversity, and educational aspirations. From the ancient libraries of Nalanda and Vikramshila to the colonial-era public libraries and today's digital knowledge centers, libraries in India reflect a continuous journey of learning, preservation, and dissemination of knowledge. Traditionally, these institutions were deeply rooted in the preservation of manuscripts, scriptures, and indigenous knowledge systems, offering access to classical texts in Sanskrit, Pali, Persian, and regional languages.

In the 21st century, the role of libraries has expanded dramatically, driven by the digital revolution, government initiatives like the National Digital Library of India (NDLI), and the presrving need for equitable access to information. Today's libraries are multifaceted spaces—combining physical collections with digital databases, offering community outreach programs, and serving as inclusive learning hubs for diverse populations. They act as bridges between the ancient and the contemporary, integrating traditional knowledge systems with modern scientific, technological, and literary developments.

Moreover, libraries play a crucial role in supporting formal and informal education, fostering research, promoting reading culture, and ensuring the democratization of knowledge across socio-economic divides. Especially in rural and underserved areas, libraries serve as vital instruments for social change, women's empowerment, and digital literacy.

As India advances toward becoming a knowledge-based economy, its libraries must continuously adapt, innovate, and reaffirm their commitment to inclusivity, cultural preservation, and lifelong learning. This evolving landscape positions libraries not only as guardians of the past but also as enablers of the future—sustaining the delicate balance between tradition and modernity in a knowledge-driven society.

2. OBJECTIVES

- To explore how Indian libraries blend traditional knowledge with modern technology.
- To assess the role of libraries in promoting inclusive and educational development.

3. RESEARCH METHODOLOGY

This study is based on a qualitative approach using **secondary sources** of data. Information has been collected from existing literature such as books, research articles, journals, government reports, library science publications, and credible online resources. The methodology involves content analysis of these sources to understand how Indian libraries have evolved over time and how they balance the preservation of traditional knowledge with the adoption of modern technologies. The findings are interpreted and highlight key trends and challenges.

4. REVIEW OF LITERATURE

Bhattacharya, G. (2002) highlights the historical role of Indian libraries as preservers of ancient manuscripts and centers of traditional learning, especially in temple and monastic institutions such as the Nalanda and Vikramshila universities.

Raghavan, K. (2010) discusses the transformation of Indian libraries during and after the colonial period, emphasizing how the British introduced Western-style public libraries while neglecting indigenous knowledge repositories.

Sharma, S. & Kumar, P. (2017) focus on the modernization of library services through ICT, particularly noting the development of the **National Digital Library of India (NDLI)** as a milestone in digital access and inclusion.

Rani, S. (2015) investigates the integration of modern library practices with traditional functions, showing how libraries serve as community knowledge hubs in both urban and rural areas.

Deshpande, M. (2009) emphasizes the role of **rural libraries** and community information centers in promoting literacy and education, especially among women and marginalized groups.

Kumar, V. (2012) provides insights into **university libraries**, highlighting their efforts to digitize rare books and manuscripts while also providing access to global academic databases.

Sarkar, A. (2016) examines the preservation of traditional manuscripts in regional and vernacular languages, pointing out challenges related to conservation, cataloguing, and public access.

National Mission on Libraries (2014), a government initiative, outlines strategies for library networking, modernization, and capacity building, aiming to transform libraries into inclusive, ICT-enabled knowledge institutions.

5. FINDINGS

Indian libraries have long been repositories of rich cultural and intellectual heritage, housing ancient manuscripts, religious texts, and regional literature that reflect centuries of accumulated wisdom. With the advent of modern technology, these institutions are transitioning into hybrid knowledge centers by digitizing traditional content and integrating advanced digital tools. For example, projects like the **Digital Library of India**, **National Manuscripts Mission**, and **NDLI (National Digital Library of India)** are playing a vital role in converting age-old manuscripts and rare documents into digital formats, thereby preserving them and making them accessible to scholars and the public worldwide. Libraries now use **integrated library management systems (ILMS)**, **barcode and RFID technology**, and **cloud-based cataloguing**, making access to both print and electronic resources faster and more efficient. Furthermore, Indian libraries are expanding their services through **virtual reading rooms**, **mobile apps**, **online public access catalogues (OPACs)**, and **e-resources**, allowing users to access knowledge anytime, anywhere. At the same time, traditional sections dedicated to regional languages, folklore, and classical literature continue to be maintained and promoted.

By merging these two dimensions—tradition and innovation—Indian libraries are ensuring that knowledge systems of the past are preserved and re imagined for future generations. This blend empowers a diverse user base, fosters

inclusive education, and supports research that values both historical depth and modern relevance.

Libraries in India play a crucial role in promoting **inclusive access to education and information**, especially in a country marked by socio-economic, linguistic, and regional diversity. By providing **free and open access** to books, digital content, and learning resources, libraries support formal education systems as well as informal, lifelong learning for people of all ages and backgrounds.

Public and community libraries, particularly in **rural and marginalized areas**, serve as essential educational hubs. They offer resources in regional languages, conduct literacy programs, and provide internet access where digital infrastructure is limited. Initiatives like **village libraries**, **digital literacy campaigns**, and **reading rooms for women and children** help bridge the educational gap between urban and rural populations.

University and school libraries contribute to academic development by supporting curriculum needs, research, and skill-building. They also promote inclusive practices by adopting **universal design**, creating **Braille and audio sections** for differently-abled users, and curating materials that reflect diverse cultural identities and local histories.

Through workshops, book clubs, digital training programs, and access to e-learning platforms like **SWAYAM** and **NDLI**, libraries foster a culture of learning and critical thinking. Thus, they function not just as repositories of knowledge but as **agents of social transformation**—empowering individuals, reducing disparities, and nurturing an informed and educated society.

6. ANALYSIS

The evolving landscape of libraries in India demonstrates a strategic effort to balance heritage preservation with technological advancement. Many prominent institutions, such as the **National Library of India**, the **Sarasvati Mahal Library**, and university libraries like those at Delhi and Banaras Hindu University, have launched digitization initiatives to preserve ancient manuscripts, rare books, and regional literature. These projects not only safeguard India's intellectual heritage but also make it more accessible through digital platforms.

At the same time, government programs like the **National Digital Library of India (NDLI)** and **National Mission on Libraries** have expanded the digital infrastructure, enabling users to access e-books, academic resources, and virtual archives. Libraries now commonly use **Integrated Library Management Systems (ILMS)**, **RFID** tagging, **online catalogs**, and **mobile apps**, making them more efficient, user-friendly, and accessible beyond physical boundaries.

In terms of inclusivity, libraries are emerging as key institutions for **bridging educational divides**. Rural libraries and community reading centers supported by state and central schemes are helping to improve literacy and provide access to learning materials in local languages. Special services, such as **Braille libraries**, **audio books**, and **children's corners**, further reflect a commitment to universal access.

Moreover, many libraries conduct **outreach programs**, **reading workshops**, and **digital literacy campaigns**, empowering women, senior citizens, and disadvantaged groups. The shift from silent reading spaces to **interactive knowledge hubs** is central to their role in educational development and social empowerment.

Overall, the analysis reveals that Indian libraries are no longer passive institutions—they are **active agents of change** that integrate cultural preservation with innovation, and equity with excellence. Their ability to blend the old and the new positions them uniquely in shaping a knowledge-based, inclusive society.

7. SUGGESTION

7.1. **Strengthen Digitization of Traditional Resources:** More funding and technical support should be provided to digitize rare manuscripts, regional literature, and archival materials. Collaboration between libraries, universities, and cultural institutions can enhance the quality and reach of these digital collections.

7.2. **Develop Multilingual Digital Platforms:** To ensure inclusivity, libraries should offer digital content in multiple Indian languages. This would support regional learners and preserve linguistic diversity while expanding access to traditional and modern knowledge.

7.3. **Enhance Digital Literacy Programs:** Libraries should regularly organize workshops on computer literacy, e-resources, and online learning tools, particularly targeting rural populations, senior citizens, and underprivileged groups.

7.4. **Promote Inclusive Infrastructure:** Libraries must ensure physical and digital accessibility for differently-abled users through ramps, screen readers, Braille books, and assistive technologies.

7.5. **Upgrade Rural Library Networks:** Investment in rural library infrastructure—high-speed internet, solar power, ICT tools—can bridge the urban-rural knowledge divide. Mobile libraries and digital kiosks can further expand access in remote areas.

7.6. **Foster Community Engagement:** Libraries should host community-based activities like reading clubs, cultural programs, local history projects, and exhibitions to make them vibrant public spaces that connect tradition with contemporary relevance.

7.7. **Integrate Library Services with National Education Platforms:** Libraries can partner with online education platforms such as SWAYAM, DIKSHA, and NDLI to offer seamless access to e-learning content, academic courses, and competitive exam preparation resources.

7.8. **Continuous Training for Library Staff**: Librarians should be trained in digital tools, cataloging software, and outreach techniques to better serve evolving user needs and manage hybrid library environments.

8. CONCLUSION

Libraries in India occupy a unique and transformative space in the nation's educational and cultural landscape. Historically rooted in the preservation of sacred texts, ancient manuscripts, and regional literature, they have always been custodians of India's intellectual and cultural wealth. In recent decades, these institutions have embraced technological advancements, evolving into hybrid spaces that balance the conservation of traditional knowledge with the dissemination of modern, digital information.

This blending of tradition and technology is not merely a functional shift—it represents a philosophical alignment with India's broader developmental goals: to create an inclusive, knowledge-based society. By digitizing rare documents, offering e-resources, and providing ICT-enabled services, libraries have become powerful tools for democratizing knowledge. In rural and underserved communities, libraries play an even more critical role—serving as gateways to literacy, education, and empowerment.

Moreover, by offering resources in multiple languages and catering to diverse user groups—including students, researchers, differently-abled individuals, and senior citizens—libraries are fostering inclusivity in its truest sense. The increasing adoption of digital library platforms such as the **National Digital Library of India (NDLI)** and integration with educational initiatives like **SWAYAM** reflect a commitment to bridging both the digital divide and the socio-economic barriers to education.

Despite these advances, challenges remain—particularly in the areas of infrastructure, funding, staff training, and rural outreach. For libraries to fully realize their potential as agents of social and educational transformation, there is a pressing need for collaborative efforts among government bodies, academic institutions, and civil society.

In conclusion, Indian libraries are no longer passive archives of information; they are living institutions that connect the timeless wisdom of the past with the dynamic demands of the present and future. As India strides toward becoming a global knowledge leader, libraries will continue to be foundational in shaping an enlightened, inclusive, and culturally resilient society.

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LEADERSHIP IN CRISIS: EXPLORING TRANSFORMATIONAL APPROACHES TO WORKPLACE FAILURE

SURAJ DAS
DR. BIPASHA CHETIYA BARUA

ABSTRACT

Workplace failure is inevitable in fast-paced corporate environments. How organizations respond to these failures often determine long-term success. This study explores how transformational leadership functions as a strategy for managing work failure, with special reference to Tata Motors Ltd. The research investigates how the key components of transformational leadership idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration contribute to building a failure-tolerant culture. Employing a field study, the study reveals that transformational leadership enhances psychological safety, promotes learning from errors, and motivates employees to convert setbacks into growth opportunities.

KEYWORDS: Transformational Leadership, Work Failure, Psychological Safety, Learning Behaviour, Work Motivation.

Assistant Professor, Department of Management, Lakhimpur Commerce College

Associate Professor, Faculty of Commerce and Management Studies, Dibrugarh University

1. INTRODUCTION:

In a volatile and competitive global market, companies face frequent disruptions, errors, and performance breakdowns. Leadership plays a pivotal role in how such failures are managed. Transformational leadership, with its focus on inspiring and developing followers, has emerged as a powerful framework in navigating organizational challenges. Work failure refers to a deviation from expected outcomes in organizational tasks, processes, or strategies. Transformational leadership consists of four key dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. Existing studies show that such leadership drives psychological safety, innovation, and learning from failure. Leaders who demonstrate these behaviors help organizations accept, analyze, and learn from errors, enabling long-term resilience and adaptability. Tata Motors Ltd, a key player in the Indian automotive sector, provides a rich context to examine this relationship. This research aims to understand how transformational leadership at Tata Motors supports work failure management by fostering a learning-oriented and psychologically safe culture.

2. REVIEW OF LITERATURE

Transformational leadership, first conceptualized by Burns (1978) and later expanded by Bass (1985), is widely acknowledged for its role in inspiring and motivating followers beyond transactional rewards. In the context of workplace failure, transformational leadership proves instrumental in creating a culture of resilience, adaptability, and continuous learning.

Transformational Leadership: A Catalyst for Positive Failure Management

Transformational leaders tend to reframe failures as learning opportunities rather than threats, which is crucial for employee growth and organizational development (Bass & Avolio, 1994). Their approach to handling setbacks involves emotional intelligence, clear communication, and the ability to foster trust—elements critical in maintaining employee morale during adversity (Gooty et al., 2009). According to Eisenbeis and Boerner (2013), transformational leaders promote psychological safety, allowing employees to openly discuss mistakes without fear of punishment. This openness encourages experimentation and innovation, reducing the stigma around failure.

Industry Example: Satya Nadella's leadership at Microsoft is a strong case of transformational leadership in action. Upon becoming CEO, Nadella reshaped the organizational culture by promoting a "growth mindset." He encouraged experimentation and learning from failure, leading to major innovations like Azure and the success of Microsoft Teams, ultimately transforming the company's competitive position in the tech sector.

Impact on Employee Coping and Learning Behavior

Workplace failures can often lead to emotional distress and reduced productivity. However, transformational leaders, through individualized consideration and inspirational motivation, help employees cope effectively (Zacher & Jimmieson, 2013). By offering support and recognizing individual potential, leaders guide employees in converting failure experiences into meaningful learning (Harms et al., 2011). Studies have shown that transformational leadership enhances organizational learning by encouraging reflection and feedback (Berson et al., 2006). This behavior is particularly useful in dynamic and failure-prone environments where adaptability is vital.

Industry Example: At Google, managers are trained to be empathetic and emotionally supportive, especially during high-stakes innovation projects. When the Google Glass project did not meet market expectations, leadership focused on learning rather than blame. This response preserved psychological safety and allowed the company to reallocate talent and ideas into more successful ventures like Google Lens and AI integration.

Fostering a Failure-Tolerant Organizational Culture

The ability of transformational leaders to cultivate a culture that tolerates and learns from failure has strategic implications. Wang and Rode (2010) argue that such leadership facilitates adaptive performance, which is essential in rapidly changing industries. When failure is treated as a feedback mechanism rather than a flaw, organizational resilience strengthens. Furthermore, transformational leadership significantly impacts team dynamics. Through intellectual stimulation, leaders encourage creative problem-solving, thus turning failures into innovative outcomes (Jung et al., 2003).

Industry Example: Tata Motors' Nano car faced market failure despite being a technically impressive product. Instead of penalizing employees, Tata Group leadership analyzed strategic missteps and redirected focus. The failure became a springboard for internal innovation and led to new product development initiatives, sustaining a culture of trust and long term commitment.

Dare to Try is a prize given as part of Tata's annual Innovista innovation awards. **It celebrates the most novel, daring and seriously attempted ideas that did not achieve the desired result.** In this way, Tata rewards innovation behaviors, and not just results.

P&G gives out a **"Heroic Failure"** award each year to the individual or team who took the greatest 'intelligent' risk at the company. At the heart of heroic failure award is the idea that **'making mistakes is ok here, trying to hide them is not.**'

Supercell **celebrates success with beer and failure with champagne.** The celebration serves as a way to make clear that a project is done; the emphasis on failed projects makes it clear that failure is acceptable.

Spotify encourages finding ways to ensure fast failure recovery rather than simply avoid failing at all. The **Fail wall** publicly showcases failures and serves as the beginning of a ritual where a squad conducts post-mortems and retrospectives that allow it to capture key learnings from the experience.

To increase comfort with sharing in-progress work in facilitating iteration and improvement, at the end of each week, SCOPLEY, a gaming-based company holds a "**Fail of the Week**" session, during which a member of each team shares their most epic failure and what he or she learns from it.

Relevance in the Contemporary Organizational Context

While transactional leaders often emphasize compliance and short-term results, transformational leaders emphasize vision, personal development, and long-term growth (Bass, 1999). This orientation makes them more effective in managing workplace failures, which often require long-term strategies and emotional support (Judge & Piccolo, 2004).

In a post-pandemic world, where uncertainty and disruption are common, the relevance of transformational leadership has increased manifold. Research by Afsar et al. (2021) demonstrates that such leadership not only improves failure recovery but also enhances employee engagement and innovation—key determinants of competitive advantage.

Industry Example: IBM's CEO Arvind Krishna implemented a transformational leadership strategy during the COVID-19 crisis. By shifting rapidly to digital collaboration tools and empowering managers to support remote teams, IBM preserved employee engagement and productivity despite significant operational challenges.

Drawing from this culmination of literature, the researcher argues that tolerating failure creates a positive climate in the work place which further assists employees in realising the intervening barriers in response to their recent failure event.

3. OBJECTIVES OF THE STUDY

1. To study the role of transformational leadership on employees' psychological safety.
2. To study the role of transformational leadership on employees' learning behaviour.

4. RESEARCH DESIGN

The study is descriptive in nature and based on both primary and secondary data. The researchers have adopted simple random sampling method and administered a structured questionnaire to the employees of functional teams, made up of managers or supervisors and direct reports, and these included sales teams, management teams of Tata Motors to collect the necessary information required for the study. A five-point Likert-Scale has been used to collect data from 270 respondents. The researcher has taken utmost care to ensure that the confidentiality of responses is maintained and the commitment is communicated to employees aptly.

5. RESULTS AND DISCUSSION

Demographic Information of the Respondents

Table 1.

Variables	Measuring group	Respondents
Gender	Male	147(54%)
	Female	123(46%)
Age group	21-30 years	78(29%)
	31-40 years	149(55%)
	41-50 years	43(16%)

Source: Primary Data

Table 1 represents the demographic information of the respondents. The first classification of table provides the gender information which shows that about 54 percent (%) of the respondents are male and the rest 46 percent (%) are female.

Furthermore, the table provides information about respondents' age group. The first classified age group of 21-30 years accounts for 29 % and the next age group of 31-40 years accounts for 55 %, the 41-50 years' age group is 16%.

Figure 1: Simple Regression Analysis

H1: Transformational leadership is positively related to employees' psychological safety

Hypothesis	Regression Weights	Beta Coefficient	R^2	F	p-value	Hypothesis Supported
H1	TL→PS	.912	.832	1329.193	.000	Yes

Note: *p < 0.05

The hypothesis tests if transformational leadership (TL) carries as positive influence on psychological safety (PS). The dependent variable **PS** was regressed on predicting variable **TL** to test the hypothesis H1. TL significantly predicted PS, F (1, 270) = 1329.193, $p < 0.001$, which indicates that TL can play a significant role in shaping PS (b=.912, $p < 0.001$). These results clearly direct the positive influence of TL on PS. Moreover, the $R^2 = .832$ depicts that the model explains 83% of the variance in PS.

Figure 2:

H2: Transformational leadership is positively related to employees' learning behaviour.

Hypothesis	Regression Weights	Beta Coefficient	R^2	F	p-value	Hypothesis Supported
H2	TL→LB	.831	.691	600.239	.000	Yes

Note: *p < 0.05

The hypothesis tests if Transformational leadership (TL) carries as positive influence on employees' learning behaviour (LB). The dependent variable **LB** was regressed on predicting variable **FTL** to test the hypothesis H2. TL significantly predicted LB, $F(1, 270) = 600.239$, $p < 0.001$, which indicates that TL can play a significant role in shaping LB ($b=.831$, $p < 0.001$). These results clearly direct the positive influence of TL on LB. Moreover, the $R^2 = .691$ depicts that the model explains 69% of the variance in LB.

5. SUMMARY OF THE REGRESSION ANALYSIS

The simple regression analysis is the statistical technique used to analyze the relationship between a single dependent (criterion) variable and single independent (predictor) variable. In this study, simple regression analysis is used to find the effect of Transformational leadership (TL) on Employees' psychological safety (PS). The results show that Transformational leadership (TL) is positively and significantly associated with (PS). Similar tests were conducted for the second hypothesis that focused on the relationship between Transformational leadership and Employees' learning behaviour (LB). There is a positive and significant relationship between Transformational leadership (TL) and Employees' learning behaviour (LB).

6. MAJOR FINDINGS OF THE STUDY

The Transformational leadership approach plays a pivotal mediating role in how employees transition from experiencing failure to effectively managing it. The following situations illustrate this influence:

a. **When employees admit mistakes without fear of penalty:** A significant number of employees (65.84%) feel comfortable admitting their mistakes, and nearly 79% do not believe they are penalized for failures. This shows that leadership adopts transformational approach, Managerial Openness, fostering a psychologically safe space for error disclosure. In such environments, leaders contribute to building trust and openness, which are crucial in initiating the failure management process.

b. **When leaders offer emotional support during error disclosure**: With 61.11% of employees perceiving their leaders as emotionally supportive when errors are disclosed, it indicates leadership behaviors that encourage empathetic communication, promote healing after failure, and steer employees toward corrective action.

c. **When leadership encourages open discussion of mistakes:** Around 64.72% of employees reported freedom to discuss mistakes. This reflects Failure Tolerant Leadership, where leaders reduce the stigma of failure and encourage reflective discussions. Such a setting transforms failure into a learning opportunity, catalyzing the move from the post-failure phase to active failure management.

d. **When leaders assign growth-oriented responsibilities:** The implementation of a "Safe Landing" policy—where employees are given temporary leadership responsibilities—demonstrates Transformational Leadership. This kind of leadership motivates employees to recover from setbacks by giving them challenging yet safe opportunities, reinforcing self-efficacy and resilience after failure.

e. **During participation in leadership development programs:** Programs like LEAP prepare managers to guide teams in high-pressure scenarios like production delays and recalls. This shows that leadership readiness and intervention during crises are critical to guiding teams through failure recovery, reinforcing the strategic role of leadership in navigating setbacks.

f. **When employees feel psychologically safe to disclose mistakes**: The perception of safety in making mistakes (55.28%) and belief that mistake disclosure won't harm appraisals (over 56%) show that psychological safety influences coping. Employees who feel secure are more likely to reflect, seek help, and work toward resolving issues instead of withdrawing or covering up errors.

g. **When employees seek guidance after failure**: Almost half the respondents (49.4%) feel comfortable seeking help. This behavior reflects learning-oriented coping, where employees focus on acquiring knowledge and skills to manage failure constructively.

h. **During participation in structured learning interventions**: Programs like Career Explore and initiatives such as "Golden Book" error recording provide platforms where employees can process failure, learn from others, and develop proactive coping strategies. These platforms encourage constructive reflection and emotional processing, thereby reinforcing healthy coping orientations.

7. CONCLUSION:

This study reinforces the influential role of transformational leadership in managing workplace failure. Such leaders shape how teams perceive and respond to setbacks, making them key drivers of resilience and innovation in the workplace. By fostering psychological safety and encouraging learning from mistakes, transformational leaders enable organizations to transform short-term losses into long-term capabilities. Organizations aiming for sustainable growth and innovation must invest in developing such leadership capacities. Training programs, leadership assessments, and cultural interventions should be aligned toward building a workplace where failure is accepted, explored, and learned from not feared.

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EXPLORING THE GENERATIVE AI TOLLS FOR ENHANCING THE CAPACITY BUILDING IN EDUCATION AND RESEARCH: A STUDY ON NOTEBOOK LM, CONSENSUS, PERPLEXITY AND SCISPACE

DR. BIRENDER PAL

ABSTRACT

Today, generative artificial intelligence is the power of technology. There are various AI tools that are used in our day-to-day life. Every AI tool has its own features, strengths, and limitations. Some tools can be general in nature, and others may be designed for a specific purpose. This paper basically identifies four generative AI tools: NotebookLM, Consensus, Perplexity, and SCISPACE, which support different activities related to education and research. The study analyzes the technical features and advances of these four tools. It also explored the mechanism of maintaining quality parameters through the filtered mechanism used in these tools. The results highlight the core areas of education and research where these tools can be used.

KEYWORDS: NotebookLM, Consensus, Perplexity, and SCISPACE

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Librarian, Kaliabor College

1. INTRODUCTION

Today, artificial intelligence is gaining its popularity with its generative power of consuming, extracting, and visualizing the results as per the user demands. There are different tools that are used today in academic and research work. ChatGPT and Gemini have all the powerful mechanisms to support the academic and research work. Different AI tolls are available today such as Elicit, Gamma, Textpulse AI, VED-AI, Cohere, counsello.ai, Litmaps, AVIDNOTE, Jenni AI, Julius AI, etc. These AI tools available today primarily focus on educational and research activities. All these tools have different functionalities that support different steps of these works. These AI tools provide the functionalities for choosing a suitable research topic, reviewing the literatures, and bibliometric analysis from the cross-format of text, video, or multimedia. These tools also have a powerful mechanism for interaction with the uploaded documents. These tools facilitate in summarizing the literature reviewed using its analytical algorithm with the deep power of machine intelligence and learning.

2. RESEARCH PROBLEM

There are a number of tools that support education and research either generally or specifically. What are the different educational and research works supported by all these four tools? Quality is another parameter for which these tools have to be properly explored and used for quality research assistance. What are the areas of the educational and research domain where these tools can be utilized as opportunities?

3. OBJECTIVES

- To understand the technical features and advantages of NotebookLM, Perplexity, Consensus, and SCISPACE AI tools.
- To explore the quality parameter filtration techniques utilized by all these four AI tools
- To identify the educational and research work where these tools can be implemented

4. METHODOLOGY

For the purpose of this study, four AI tools are explored. Viz-Notebooklm, Consensus, Perplexity, and SCISPACE. Practical observation is noted after utilizing the different functionalities of the tools. These tools are applied practically, and results are analyzed after proper experience. Further, to check the power of generative AI, the ChatGPT platform is only used for generating a combined banner of all these four tools.

A BRIEF DESCRIPTION OF THE TOOLS USED IN THE STUDY

a. **Note book LM:** It is a generative AI tool from Google. This tool has a powerful feature to explore, analyze, and interpret data and information from various sources and provides a meaningful structure for preparing a notebook. Users can interact with multiple sources, viz., text, video, audio, websites, etc. Users can log in with their existing Google account for free usage up to a certain limit. (*Google Notebook LM*, n.d.) .

b. **Consensus:** It is a generative AI tool built with a mechanism of deep search, which explores the academic and research papers across different disciplines. It is an advanced version of the general AI search engine, which focuses on scientific and scholarly publications. It has both its free and professional versions. One of the basic features of this AI tool is that it has a filtered mechanism of harvesting the research papers in Q1, Q2, Q3, and Q4 levels of journals with further filtration of harvesting the literature on a specific time interval ("Lean More about Consensus & Our Mission," n.d.)

c. **Perplexity:** Perplexity AI is another generative tool that also focuses on literature across the web, academic papers, social sites, etc. One of the important features of this tool is the "deep research," where one can explore deeper sources. One can also upload files to it and can be able to interact and draw different conclusions based on the prompt used for it. For free users, using the Google log-in, they can explore three searches in a day. This tool also has applications for desktop and mobile devices. (*Perplexity*, n.d.) .

d. SCISPACE: This is another generative AI tool, which not only explores the literature but also provides a comprehensive explanation of the search results in a simple language form. These tools have a bundle of applications from content generation to content evaluation (*The AI for Academic Research | SciSpace*, n.d.).

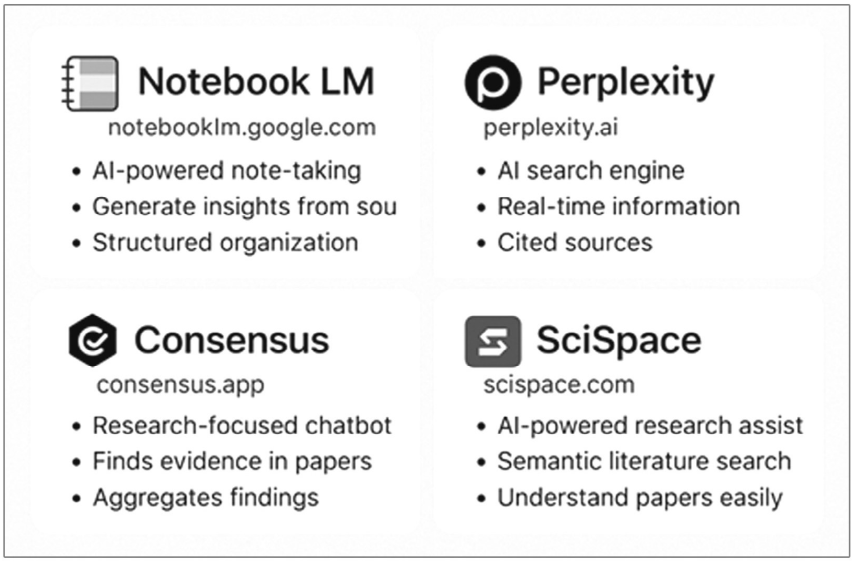

Fig1: Shows the generative power of AI where image is generated for four tools using prompt techniques.

Prompt used: *"Give an image which include the name and design of four AI tools: Notebook LM, Perplexity, Consensus and SCISPACE. Also include their website url link of each tool in the banner along with few technical features of the tool".*

(Image generated using ChatGPT)

Results

Overview of Generative AI Tools in Education and Research

Table 1: Technical features and advantages of Notebooklm, Consensus, Perplexity and SCISPACE

Tool	Technical Features	Advantages
Notebooklm	-Interaction in a single window from cross format of data platform from Pdf, YouTube videos, audios, slides, etc. -Has a multimodal support	-Information can be prepared from multiple sources -Users query can be handle from a single window across varied sources. -Mind maps features guide users to systematically follow any topic by interconnecting the parent child relationship.

Perplexity	-Has different powerful models -can go for deep research -turn ideas to document form. -can search across web, academic and social platforms -Can Upload paper and interact -can filtered discipline wise search	- Can rely on the source citation - Useful for literature review and bibliometric analysis -Also having voice mode and mobile and desktop applications.
Consensus	-Acute filtered to restrict within Q1,Q2,Q3 and Q4 journals -Restrict results within a time frame -Can exclude preprints -also explore the open access publications -Upload paper and interact	- Provides access to quality research literature - Researcher time can be saved - powerful tool for the research industry and domain - Can trace the sources track results
SciSpace	chat with Pdf, literature review, Ai writing tools, find desired topics based on inputs, paraphraser, citation generator, AI detector for AI generated content -Convert pdf to video with voice and slide generation	- one stop for many AI tools - Accelerates literature discovery - AI writing and editing tools - Plagiarism detection on AI content -Supports academic publishing -Can cite source in APA, MLA and other different citation style of referencing.

5. TECHNICAL FEATURES AND ADVANTAGES

From the above Table 1, it is analyzed that all four tools support different operations of education and research work. This tool has the mechanisms to generate and analyze the information based on the prompt provided by the user. Different educational and research work, such as creating notes, literature reviews, facilitating in the selection of research topics, bibliometric analysis, AI-generated documents, paraphrasing, similarity detection on AI documents, citation generation as per different referencing styles, etc., can be applied using these tools.

6. FILTRATION AND QUALITY LEVEL OF INFORMATION

Table 1 also provides the filtered mechanism used in all these tools. Users can expand or narrow down their search results based on the quality parameters. It can explore either the whole web domain or can restrict itself to the scholarly research papers. Further, to explore the research papers, users can limit their results within the frame of Q1, Q2, Q3, and Q4 levels of journals. The tool also supports exploring the discipline-wise search and results.

7. IMPLEMENTATION OF AI TOOLS IN DIFFERENT AREAS OF EDUCATION AND RESEARCH

- **Personal use:** These AI tools can be utilized for uplifting the skills for knowledge discovery, who may be a student, researcher, or teacher. Works like document preparation, slide preparation, video creation, preparation of quizzes, etc., can be easily performed.
- **Uplifting Research Skill:** This tool can upgrade the skills of a researcher and can save precious time through automating tasks such as literature searches, bibliometric analysis, and citation generation.
- **Equity:** This tool provides an opportunity for all types of learners. Even the learners with disabilities can utilize these tools with their requirements.
- **Turn ideas into structured information:** The analytical and generative power of these tools interact, summarize, and generate content. Users need to acquaint themselves with the prompt engineering techniques. Although the ethical concern has to be taken into account while generating any new content including its originality and genuineness. Users need to focus on creating their own idea rather than copying the idea from the multiple sources.
- **Fast Retrieval:** AI tools have a powerful search mechanism and can understand the natural language query. Information can not only be harvested from different platforms, but also it can generate information too.

8. DISCUSSION

Generative AI has the extensive capability of enriching the work of education and research. These tools can be utilized in different aspects of teaching, learning, and upgrading the research skills if utilized properly, keeping the ethical concern. Today machine learning and deep learning are integral parts of the educational system. Different Large Language Models (LLMs) are developed keeping in mind the task of a particular domain or area. The above four AI tools—Notebook LM, Consensus, Perplexity, and SCISPACE—are explored, and it has been experienced that these tools can be a facilitator to students, teachers, and researchers or even to the personal level of an individual. The tools have a filtered mechanism to explore the quality level of literature, which can assist researchers in exploring and facilitating them in quality-level literature searches. The tool has a mechanism for citation creation and other features that are an integral part of educational and research work.

9. CONCLUSION

Artificial intelligence is the backbone of today's internet technology. These tools are designed with an advanced level of technology that can understand natural language as like of human. But at the same time, if these tools are used for some unethical consideration, then it can be disastrous too. Academic and research integrity should be the prime concern of every individual who is involved in education and research. So, keeping one's own intellectuality, ideas, and innovation above, the individuals can gear up their academic and research work with these tools.

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ANALYSIS OF EXTREME PRECIPITATION: A CASE STUDY FOR NORTH EAST INDIA

DR. DHRUBA JYOTI BORA

ABSTRACT

Rainfall data of twelve gauged stations of North East India has been taken for selecting best fit model for rainfall frequency analysis. The five probability distributions, namely Generalized extreme value (GEV), Generalized Logistic (GLO), Pearson type 3 (PE3), 3 parameter Log normal (LN3) and Generalized Pareto (GPA) distributions have been considered. The methods of L-moment have been used for estimating the parameters of the probability distributions. L-moment analysis shows that PE3 is the best fitting distribution. The rainfall frequency model for the region has been developed by using the identified robust distribution for the region.

KEYWORDS: L-Moments, L-moment ratio diagram, Z-statistics.

1. INTRODUCTION

Agriculture is crucial for the economic development of North East India. Rainfall significantly affects agricultural productivity in the region. Therefore, the rainfall frequency analysis of this region is needed for understanding and predicting rainfall patterns. The study of extreme rainfall is also Helps in planning and development of infrastructure like dams and bridges. The proper estimation of rainfall frequency analysis will help to develop and also protect the economic loss of this region.

Assistant Professor, Department of Mathematics, Kaliabor college

In this study regional rainfall frequency analysis of North East India has been considered for development of frequency analysis model. For this study the method of L-moment has been used for estimation of parameters of the probability distributions. The five probability distributions, namely generalized extreme value (GEV), generalized Logistic(GL), Pearson type 3 (PE3), 3 parameter Log normal (LN3) and generalized Pareto (GPA) distributions have been considered for this study. The homogeneity of the study region has been carried out by using heterogeneity measure proposed by Hosking and Wallis (1993). Two goodness of fitness measures namely Z-statistics and L-moment ratio diagram have been employed for identification of the best fitting distribution for our study region.

2. REVIEW OF LITERATURE

Application of extreme value distribution to rainfall data have been investigated by several authors from different parts of the world. Shabri, A. B. et. al (2011) used L-moment and TL-moment to analysis the maximum rainfall data of 40 stations of Selangor Malaysia. GLO and GEV distributions were identified as the most suitable distributions for representing the statistical properties of extreme rainfall in Selangor. Deka, S. et. al (2011) fitted three extreme value distributions using LH moment of order zero to four and found that GPA distribution is the best fitting distribution for the majority of the stations in North East Region of India. Also Deka, S. et. al (2009) tried to determine the best fitting distribution to describe the annual series of maximum daily rainfall data for a period of 42 years of nine stations of North East Region of India. Generalized Logistic distribution is empirically proved to be the most appropriate distribution for the majority of the stations in North East Region of India. Olofintoye, O.O. et. al (2009) analysed annual rainfall data of 54 years from20 different stations of Nigeria using Gumbel, Log-Gumbel, Normal, Log-Normal, Pearson and Log-Pearson distribution. The result showed that the Log-Pearson Type III distribution was the best distribution. Lee (2005) studied the rainfall distribution characteristics of Chia-Non plain area by using different statistical analyses such as normal distribution, log-normal distribution, extreme value type I distribution, Pearson type III distribution and log-Pearson type III distribution. The result showed that the log-Pearson type III distribution performed the best probability distribution occupying 50% of the total station number. Zalina et. al (2002) studied maximum rainfall frequency analysis of Malaysia and found that GEV distribution is the most appropriate distribution for describing the annual maximum rainfall series in Malaysia. Ogunlela (2001) studied the stochastic analysis of rainfall event in Ilorin using probability distribution functions. He found that the log Pearson type III distribution is the best for describing peak daily rainfall data of Ilorin.

3. STUDY REGION AND DATA COLLECTION

For this study 12 gauged stations of the North East India viz. Imphal, Agartala, Shillong, Guwahati, Silchar, Jorhat, Dhubri, Lengpui, Lakhimpur, Pasighat, Mohanbari and Itanagar are considered. Annual maximum rain fall data of these stations for a period of 30 years from 1984 to 2013 are considered for this study. Data are collected from Regional Meteorological centre, Guwahati.

4. METHODOLOGY

Method of L-Moment

The probability weighted moments (PWMs) of a random variable X with cumulative distribution function (CDF), $F(.)$ were defined by Greenwood et al [4] as:

$$\beta_r = M_{1,r,0} = E[X\{F(X)\}^r] \quad (1)$$

where, $M_{p,r,s} = E\left[X^p\{F(X)\}^r\{1-F(X)\}^s\right]$ (2)

and β_r can be rewritten as:

$$\beta_r = \int_0^1 x(F)F^r dF, \qquad r=0,1,2\ldots \quad (3)$$

where, $x(F)$ is the inverse CDF of x evaluated at the probability F.

The general form of L-moments in terms of PWMs is given by Hosking and Wallis [7] as

$$\lambda_{r+1}=\sum_{k=0}^{r}p_{r,k}^{*}\beta_k \qquad (4)$$

where, $p_{r,k}^{*}$ defined by Hosking and Wallis [7] as

$$p_{r,k}^{*}=\frac{(-1)^{r-k}(r+k)!}{(k!)^2(r-k)!} \qquad (5)$$

The first four L-moments can be defined as:

$$\lambda_1=\beta_0 \qquad (6)$$

$$\lambda_2=2\beta_1-\beta_0 \qquad (7)$$

$$\lambda_3=6\beta_2-6\beta_1+\beta_0 \qquad (8)$$

$$\lambda_4=20\beta_3-30\beta_2+12\beta_1-\beta_0 \qquad (9)$$

Hosking and Wallis [7] defined L-moments ratios (LMRs) as:

Coefficient of L-variation, $\tau=\lambda_2/\lambda_1$

Coefficient of L-skewness $\tau_3=\lambda_3/\lambda_2$ (10)

Coefficient of L-kurtosis $\tau_4=\lambda_4/\lambda_2$

Regional Rainfall Frequency Analysis using L-moment

According to Hosking and Wallis [6] & [7] regional frequency analysis using an index flood procedure involves four steps. They are

1. Screening of the data.
2. Identification of homogeneous regions.
3. Choice of a frequency distribution
4. Estimation of the frequency distribution.

For all calculation Fortran Package developed by Hosking (2005) has been used.

5.1. SCREENING OF DATA:

Hosking and Wallis [6] proposed the Discordancy test D_i to screen out data from stations whose point sample L-moments are markedly different from other stations. The objective is to check the

$$D_i = \frac{1}{3} N (u_i - \bar{u})^T S^{-1} (u_i - \bar{u}) \tag{11}$$

where $S = \sum_{i=1}^{N} (u_i - \bar{u})(u_i - \bar{u})^T$ and $u_i = \left[t_2^i, t_3^i, t_4^i\right]^T$ for i-th station, N is the number of stations , S is covariance matrix of u_i and $\bar{u}$ is the mean of vector, u_i . Critical values of discordancy statistics are tabulated by Hosking and Wallis [6]. For $N = 12$, the critical value is 2.757. If the D-statistics of a station exceeds 2.757, its data is discordant from the rest of the regional data.

5.2. IDENTIFICATION OF HOMOGENEOUS REGION

An essential task in regional frequency analysis is the determination of homogeneous regions. Hosking and Wallis [6] suggested the heterogeneity test, H, where L- moments are used to assess whether a group of stations may reasonably be treated as belonging to a homogeneous region. The proposed heterogeneity tests are based on the L-coefficient of variation L-skewness and L-kurtosis. These tests are defined respectively as

$$V_1 = \sqrt{\sum_{i=1}^{N} n_i (t_2^{(i)} - t_2^{R})^2 / \sum_1^N n_i}, \tag{12}$$

$$V_2 = \sum_{i=1}^{N} \{n_i [(t_2^{(i)} - t_2^{R})^2 + \left(t_3^{(i)} - t_3^{R}\right)^2]^{\frac{1}{2}}\} / \sum_{i=1}^{N} n_i, \tag{13}$$

$$V_3 = \sum_{i=1}^{N} \{n_i [(t_3^{(i)} - t_3^{R})^2 + \left(t_4^{(i)} - t_4^{R}\right)^2]^{\frac{1}{2}}\} / \sum_{i=1}^{N} n_i. \tag{14}$$

The regional average L-moment ratios are calculated using the following formula:

$$t_2^R = \sum_{i=1}^{N} n_i\, t_2^i / \sum_{i=1}^{N} n_i,$$

$$t_3^R = \sum_{i=1}^{N} n_i\, t_3^i / \sum_1^N n_i, \tag{15}$$

$$t_4^R = \sum_{i=1}^{N} n_i\, t_4^i / \sum_1^N n_i.$$

where N is the number of stations and n_i is the record length ati-th station.

The heterogeneity test is then defined as

$$H_j = \frac{V_j - \mu_{V_j}}{\sigma_{V_j}} \quad , \quad j = 1,2,3 \tag{16}$$

where μ_{V_j} and σ_{V_j} are the mean and standard deviation of simulated V_j values, respectively. The region is acceptably homogeneous, possibly homogeneous and definitely heterogeneous with a corresponding order of L-moments according as $H<1$, $1\leq H<2$ and $H\geq 2$.

5.3. CHOICE OF A FREQUENCY DISTRIBUTION

In this step the best fit distribution is selected from several probability distributions. For this purpose, Hosking and Wallis [6] proposed two goodness of fit measures.

(a) Z-statistic Criteria

The Z-test judges how well the simulated L-Skewness and L-kurtosis of a fitted distribution matches the regional average L-skewness and L-kurtosis values. For each selected distribution, the Z-test is calculated as follows

$$Z^{DIST} = (\tau_4^{Dist} - t_4^R)/\sigma_4 \quad (17)$$

where DIST refers to a particular distribution, τ_4^{DIST} is the L-kurtosis of the fitted distribution while the standard deviation of t_4^R is given by

$$\sigma_4 = \left[(N_{sim})^{-1}\sum_{m=1}^{N_{sim}}(t_4^{(m)} - t_4^R)^2\right]^{1/2}$$

t_4^m is the average regional L-kurtosis and has to be calculated for the m^{th} simulated region. This is obtained by simulating a large number of kappa distribution using Monte Carlo simulations. The value of the Z-statistics is considered to be acceptable at the 90% confidence level if $|Z^{DIST}| \leq 1.64$. If more than one candidate distribution is acceptable, the one with the lowest $|Z^{DIST}|$ is regarded as the best fit distribution.

(a) L-Moment Ratio Diagram

It is a graph of the L-skewness and L-kurtosis which compares the fit of several distributions on the same graph. According to Hosking and Wallis [7], the expression of τ_4 in terms of τ_3 for an assumed distribution is given by

$$\tau_4 = \sum_{k=0}^{8} A_k \tau_3^k \quad (18)$$

where the coefficients A_k are tabulated by Hosking and Wallis [7].

5.4. ESTIMATION OF FREQUENCY DISTRIBUTION

In this step the regional parameters of the best fit distribution are calculated. For this purpose, regional average L-moments are used in the expressions of L-moments (in section 2.3) of the best fit distribution. Putting the parameters of the best distribution in the quantile function, growth factors are calculated.

6. RESULTS AND DISCUSSION

Using discordancy test the D_i values of all the twelve stations are calculated. From Table 1 it is observed that the values of all the twelve stations are less than critical value 2.757. Therefore, all the data of twelve stations are considered for the development of regional maximum rainfall estimation.

Table 1: Discordancy measures of each sites of the NE region using L-moments.

Name of sites	No. of observations	τ	τ_3	τ_4	D_i
1. Guwahati	30	0.1509	0.2298	0.1551	0.27
2. Mohanbari	30	0.1458	0.1521	.1011	0.09
3. Silchar	28	0.1449	0.1420	0.1345	0.61
4. Lakhimpur	30	0.1394	0.2107	0.0976	0.93
5. Passighat	30	0.2224	0.3773	0.3455	1.82
6. Agartala	30	0.1763	0.1421	0.0529	1.30
7. Imphal	30	0.1772	0.2015	0.1711	0.19
8. Shillong	30	0.1863	0.1569	0.1778	1.32
9. Itanagar	26	0.1710	0.3629	0.2452	1.45
10. Dhubri	22	0.1798	0.1620	0.0904	0.75
11. Jorhat	25	0.1196	-0.0514	-0.0832	1.72
12. Lengpui	13	0.1166	0.1523	0.1265	1.56

(D_i values of 12 stations are less than the critical value 2.757)

Using heterogeneity measures, H_1, H_2 and H_3 are calculated. From Table 2 it is observed that the value of H_1 lies between 1 and 2, that of H_2 and H_3 are less than 1. Hence the study region can be considered as a possibly homogeneous one.

Table 2: Heterogeneity measures using L-moments.

H_1	H_2	H_3
1.54	-0.35	0.40

($1<H_1<2$, $H_2<1$ and $H_3<1$)

The calculated values of Z-statistics are given in Table 3. From Table 3 it is observed that the absolute values of Z-statistics for GEV, GNO and PE3 distributions are less than 1.64 respectively. But the absolute values of Z-statistics for PE3 distribution is the lowest. Therefore, PE3 distribution has been selected as the best fitting distribution for regional rainfall analysis of North East India.

Also from the L-moment ratio diagram (Figure 1) it is observed that the regional average is nearer to the PE3 distribution curve. Hence PE3 distribution is selected as the best fit distribution.

Table 3: Z-statistics values of the distributions using L-moment

Sl. No.	Name of the probability distribution	Z-Statistics values
1	GLO	2.58
2	GEV	0.87
3	GNO	0.55
4	**PE3**	**0.19**
5	GPA	2.97

($|Z^{GEV}| < 1.64$, $|Z^{GNO}| < 1.64$ and $|Z^{PE3}| < 1.64$. But $|Z^{PE3}|$ is the lowest.)

The Parameters of the best fit distribution are given in Table 4. Substituting the regional parameters of the best distributions in respective quantile function the quantiles are estimated. Estimated quantiles are given in Table 5.

Table 4: Regional parameters of best fitting distribution using L-moments.

Best fitting distribution	Parameters		
	Location	Scale	Shape
PE3	1.000	0.302	1.155

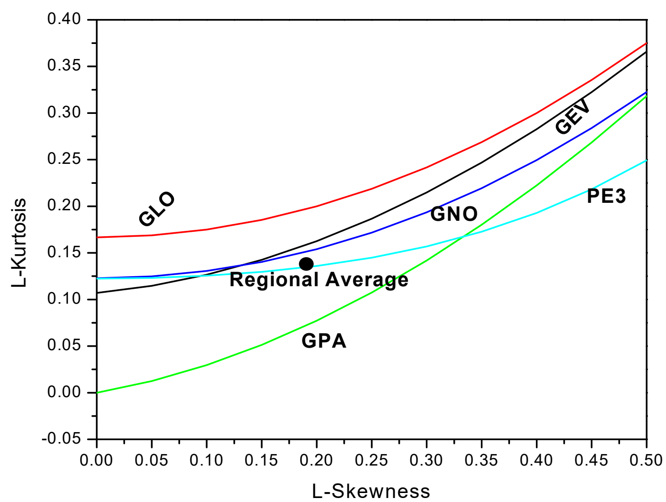

Figure1 L-moment ratio diagram for NE region

(Regional value of L-skewness and L-kurtosis is nearer to the PE3 distribution curve)

Table 5: Quantile estimates by using best fitting distribution.

Best fit Distribution	Return period (in years)				
	2	10	20	100	1000
PE3	0.943	1.450	1.574	1.942	2.434

7. Development of Regional Rainfall Frequency Relationship

The regional rainfall frequency relationship is developed using flood index procedure for our study region.

The form of regional rainfall frequency relationship or growth factor for the best fit distribution PE3 can be expressed as

$$Q_T = \left[\mu + \sigma \frac{2}{\gamma}\left\{\left\{1 + \frac{\gamma \emptyset^{-1}(F)}{6} - \frac{\gamma^2}{36}\right\}\right\}^3 - \frac{2}{\gamma}\right] * \mu_i \quad (19)$$

where Q_T is the maximum rainfall at return period T, μ_i is the mean annual maximum rainfall of the ith site of the region, $F = 1 - 1/T$, $\emptyset^{-1}(.)$ has a standard normal distribution with zero mean and unit variance. Parameters γ, μ and σ are the standard parameterizations which are given in the Table 4. Substituting these values in expression (19) rainfall frequency relationship for gauged sites of study area is expressed as:

$$Q_T = \left[1.000 + \frac{0.604}{1.155}\left\{\left\{1 + \frac{1.155\emptyset^{-1}(F)}{6} - \frac{1.334}{36}\right\}\right\}^3 - \frac{2}{1.155}\right] * \mu_i \quad (20)$$

For estimation of maximum rainfall for a desired return period above regional flood frequency relationship may be used.

7. CONCLUSIONS:

Discordancy measure shows that data of all gauging sites of our study area are suitable for using regional frequency analysis. Also from homogeneity test, the region has been found to be possibly homogeneous. Regional rainfall frequency analysis has been performed using five extreme probability distributions: viz. GLO, GEV, GPA, GNO and PE3. Using L-moment ratio diagram and Z-statistic it is found that PE3 distribution is the best fit distribution for regional rainfall frequency analysis of North East India. The parameters of PE3 distribution are calculated and using the quantile function of PE3 distribution regional growth factors are calculated. The regionalrainfall frequency relationship for gauged stations has been developed for the region and can be used for estimation of maximum rainfalls at desired return periods.

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ARTIFICIAL INTELLIGENCE AND ETHICS: HOW AI IS SHAPING INDUSTRIES AND THE ETHICAL CHALLENGES IT PRESENTS

RICHITA HAZARIKA

ABSTRACT

Artificial Intelligence (AI) is a transformative force across global industries, enhancing efficiency, decision-making, and innovation. From healthcare and finance to manufacturing and education, AI applications are increasingly embedded in operational workflows. However, as AI evolves, it also raises ethical questions related to bias, privacy, transparency, and accountability. This paper explores the dual impact of AI: its industrial advancements and the ethical dilemmas it introduces. It discusses key applications, presents case studies of ethical challenges, and offers frameworks for responsible AI development and deployment. Finally, the paper proposes a roadmap for policymakers, engineers, and businesses to align AI systems with human values.

KEYWORDS: Artificial Intelligence, AI Ethics, Algorithmic Bias, Industry 4.0, Data Privacy, Explainability, Fairness in AI, Global Governance, Human-Centered AI

PG graduate, Department of Energy, Tezpur University, Assam.
PG Research Project Department of Mechanical Engineering, IIT Bombay, Bombay.

INTRODUCTION

Artificial Intelligence has moved from speculative fiction to a scientific and industrial reality, now functioning as a core enabler of the Fourth Industrial Revolution. Leveraging foundational fields such as machine learning, natural language processing, and computer vision, AI systems today are not only capable of learning and pattern recognition but also demonstrate adaptive, generative, and autonomous decision-making capacities. These capabilities have been embedded across sectors, including autonomous systems in transportation, decision-support in healthcare, algorithmic trading in finance, and robotic process automation in manufacturing. According to the World Economic Forum (2020), AI is expected to displace approximately 85 million jobs while simultaneously creating 97 million new roles by 2025 that highlighting a profound socioeconomic restructuring.

From a technical standpoint, modern AI systems are increasingly characterized by deep neural architectures, reinforcement learning paradigms, and large-scale unsupervised language models (e.g., GPT, BERT). These systems are trained on high-dimensional, multimodal data sources often numbering in petabytes using distributed computing infrastructures that optimize millions of parameters. However, this complexity also introduces significant challenges related to model interpretability, data provenance, and computational bias.

AI's integration is not without ethical consequence. Issues such as algorithmic opacity, feedback loops in decision-making, and representational harms are no longer theoretical, they manifest in real-world harms. For instance, biased recruitment tools, discriminatory facial recognition, and opaque credit scoring algorithms have all triggered regulatory backlash. The
Cambridge Analytica scandal, misuse of predictive policing systems, and discriminatory healthcare triage algorithms further emphasize that AI, without ethical guardrails, can reinforce structural inequality, exploit asymmetries of information, and violate individual rights.

As nations and corporations accelerate AI development to gain geopolitical and economic advantage, the ethical frameworks guiding these deployments remain inconsistent, under- enforced, or poorly defined. The urgency to bridge this gap has given rise to global policy efforts (e.g., the EU AI Act, UNESCO AI Ethics), yet effective operationalization remains a work in progress. Therefore, this paper aims to investigate not only how AI is shaping industrial transformation but also how ethical challenges rooted in both socio-technical complexity and institutional inertia that must be systematically addressed to align AI systems with human- centric values and democratic norms.

LITERATURE REVIEW

The ethical dimensions of artificial intelligence (AI) have attracted increasing scholarly attention, leading to the emergence of frameworks and principles to guide responsible AI development. Mittelstadt et al. (2016) laid the groundwork by systematically mapping the ethical concerns associated with algorithmic systems. They identified key challenges such as opacity (black-box models), responsibility diffusion, and the risk of bias, particularly in automated decision-making contexts like criminal justice, healthcare, and financial services. Wachter et al. (2017) further elaborated on the concept of algorithmic transparency, arguing for the necessity of "counterfactual explanations" to satisfy accountability demands in AI- driven decisions. Their work emphasized the legal and ethical implications of AI opacity under regulations like the EU's GDPR, which guarantees a right to explanation.

Floridi et al. (2019) introduced a five-principle framework for ethical AI governance beneficence, non-maleficence, autonomy, justice, and explicability proposed as a foundation for human-centered AI. These principles have since been adopted or mirrored in several global policy documents, including the OECD Principles on AI (2019) and UNESCO's Recommendation on the Ethics of Artificial Intelligence (2021), both of which stress transparency, fairness, inclusiveness, and robustness.

Empirical work by Buolamwini and Gebru (2018) in the "Gender Shades" project revealed significant racial and gender disparities in commercial facial recognition systems, with error rates as high as 34.7% for darker-skinned women compared to 0.8% for lighter-skinned men. Their study catalyzed widespread calls for algorithmic audits and was instrumental in prompting firms like IBM, Microsoft, and Amazon to suspend or review their facial recognition offerings.

More recently, Nemitz (2018) argued that AI regulation must integrate democratic oversight and human rights protections to prevent the commodification of personal data and algorithmic manipulation of public discourse. Similarly, Whittlestone, Nyrup, Alexandrova, and Cave (2019) proposed a pragmatic approach to AI ethics through "bridging principles" that connect abstract ethical theory with real-world constraints and stakeholder concerns.

National strategies also reflect these scholarly debates. India's #AIforAll (NITI Aayog, 2018) emphasizes inclusive AI adoption in agriculture, healthcare, and education, while the EU's AI Act proposes a tiered regulatory model based on application risk. The World Economic Forum (2020) frames AI as a key disruptor of global labor markets, requiring proactive governance to mitigate inequality.

Collectively, the literature converges on the need for value-sensitive, multidisciplinary, and participatory governance structures that not only minimize harm but also promote equity, accountability, and trust in AI systems. This paper synthesizes these findings and builds on them by incorporating updated industrial use cases, ethical risks, and governance mechanisms.

OBJECTIVE OF THE STUDY

The primary objective of this study is to investigate the dual role of Artificial Intelligence (AI) in driving industrial innovation and raising critical ethical concerns. The research aims to identify the most impactful use cases of AI across major industries such as healthcare, finance, education, manufacturing, and public safety, while critically examining ethical challenges such as algorithmic bias, lack of transparency, and privacy invasion. By synthesizing academic literature, case studies, and policy frameworks, the study provides actionable insights for aligning AI development with ethical and societal values.

METHODOLOGY

This research employs a qualitative, interdisciplinary approach. It synthesizes peer-reviewed academic publications, industry reports, and global policy documents to construct a multi- faceted understanding of AI's influence on industrial transformation and ethical considerations.

Case studies from multiple sectors like healthcare diagnostics, algorithmic finance, educational AI platforms, and surveillance systems are examined to assess real-world ethical risks and governance responses. Furthermore, this study reviews national and international frameworks, such as the EU Artificial Intelligence Act and UNESCO's ethical guidelines, to benchmark current governance models. The methodology also integrates comparative analysis to identify cross-sectoral patterns and develop ethical AI recommendations based on best practices and policy gaps.

INDUSTRIAL APPLICATIONS OF AI AND ETHICAL DIMENSIONS

HEALTHCARE

AI has revolutionized diagnostic imaging, robotic surgery, predictive analytics, and patient engagement. For instance, Google's DeepMind demonstrated a model that could detect over 50 eye diseases from retinal scans with 94% accuracy, on par with ophthalmologists. Similarly, IBM Watson Health collaborated with Memorial Sloan Kettering Cancer Center to develop oncology decision-support tools trained on over 600,000 medical evidence documents, 2 million pages of text, and 1.5 million patient records. Mayo Clinic has piloted AI algorithms for early detection of atrial fibrillation using ECG data, resulting in improved risk stratification and reduced stroke incidences.

These tools show promising clinical outcomes. A meta-analysis by Rajpurkar et al. (2018) found that deep learning models achieved comparable or superior performance to radiologists in interpreting chest X-rays. However, disparities in data representation remain. A 2019 study published in *Science* revealed that an AI healthcare algorithm used on 200 million people in the U.S. showed racial bias, as it underestimated the needs of Black patients by

50%. Such cases highlight the importance of demographic diversity in training data and the need for model transparency in clinical environments. robotic surgery, predictive analytics, and patient engagement. For instance, Google's DeepMind demonstrated a model that could detect over 50 eye diseases from retinal scans with 94% accuracy, on par with ophthalmologists.

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FINANCE AND INSURANCE

Financial institutions use AI for fraud detection, underwriting, and portfolio optimization. JPMorgan Chase's COiN platform reportedly reviewed 12,000 legal documents in seconds thtat is a task that took lawyers over 360,000 hours.

Ethical pitfalls arise in credit scoring. An investigation by *ProPublica* revealed that machine learning tools in lending frequently penalized applicants from minority neighbourhoods, even when creditworthiness was similar. These outcomes violate fairness and raise questions about regulatory oversight.

MANUFACTURING AND LOGISTICS

AI-enabled predictive maintenance reduces equipment downtime. GE Digital reported that AI- based diagnostics helped reduce unplanned outages in power plants by 10–20%, saving millions annually. Amazon uses AI to optimize warehouse workflows through its robotic Kiva system.

However, automation leads to labor market disruptions. The OECD (2020) estimates that 14% of jobs are at high risk of automation, disproportionately affecting lower-income workers. Ethical deployment should include reskilling programs and employment support.

EDUCATION AND Ed TECH

Adaptive learning platforms like Carnegie Learning and Squirrel AI personalize curriculum pathways based on student progress. During the COVID-19 pandemic, over 1.6 billion students shifted online, accelerating AI adoption in education. Studies show AI-enhanced tools improve learning efficiency like Carnegie Learning reported a 30% improvement in math performance in high school pilot programs. Squirrel AI claims an average learning efficiency increase of 46% compared to traditional classroom instruction.

A comparative study published in the *Journal of Educational Technology* (2021) found that students using AI-based tutors scored on average 11% higher in post-assessments than those using standard online modules. Additionally, dropout rates decreased by 15% when AI systems intervened with timely feedback and engagement strategies.

Yet, proctoring software like Proctorio drew criticism for intrusive monitoring. The ACLU noted that facial recognition in exam tools could discriminate against students with darker skin or non-binary gender expressions. Ethical use demands informed consent, privacy safeguards, transparency in data handling, and opt-out provisions. like Carnegie Learning and Squirrel AI personalize curriculum pathways based on student progress. During the COVID-19 pandemic, over 1.6 billion students shifted online, accelerating AI adoption in education.

MEDIA, ARTS, AND CONTENT GENERATION

GPT-based tools are generating human-like text, voiceovers, music, and visual art. The viral spread of deepfakes such as fabricated videos of public figures has undermined information integrity. In 2023, a deepfake of Ukrainian President Zelenskyy falsely announcing surrender circulated on social media, sparking global concern.

Such tools challenge the notion of authorship and truth. Content labeling, digital watermarks, and ethical use agreements are essential to mitigate misuse.

SMART CITIES AND PUBLIC SAFETY

AI systems power surveillance cameras, traffic flow optimization, and emergency response. China's "Skynet" system reportedly has over 600 million cameras using facial recognition to track citizens.

While effective for public safety, this raises significant privacy and autonomy concerns. Now AI Institute (2020) warns that such systems may disproportionately target marginalized communities without recourse or oversight.

ETHICAL CHALLENGES ACROSS DOMAINS

BIAS AND FAIRNESS

Bias can originate from skewed datasets, non-representative sampling, or societal prejudices embedded in training data. Joy Buolamwini's (2018) Gender Shades study found that commercial facial recognition had an error rate of 34.7% for dark-skinned women, compared to 0.8% for light-skinned men.

Additional case studies further highlight systemic bias. Amazon discontinued an AI resume- screening tool after it was found to downgrade resumes containing the word "women's," as the system had been trained on male-dominated hiring data. In law enforcement, predictive policing tools like PredPol were shown to disproportionately target minority neighborhoods, reinforcing biased patrol patterns rather than crime rates.

To combat this, companies must adopt impact assessments, fairness-aware algorithms, and regular audits. Efforts should include interdisciplinary teams, transparent validation processes, and independent third-party reviews to ensure that AI systems do not perpetuate or amplify social inequalities. from skewed datasets, non-representative sampling, or societal prejudices embedded in training data. Joy Buolamwini's (2018) Gender Shades study found that commercial facial recognition had an error rate of 34.7% for dark-skinned women, compared to 0.8% for light-skinned men.

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PRIVACY AND DATA GOVERNANCE

The Cambridge Analytica scandal exemplifies data misuse 50 million Facebook profiles were harvested without consent to influence elections. AI's appetite for data necessitates stringent governance frameworks.

GDPR's principles like data minimization and explicit consent should be global standards. Initiatives like federated learning also help by keeping data decentralized.

TRANSPARENCY AND EXPLAINABILITY

Explainable AI (XAI) improves accountability. In healthcare, the inability to explain AI decisions limits clinical adoption. SHAP (SHapley Additive exPlanations) and LIME (Local Interpretable Model-agnostic Explanations) help visualize model logic.

However, more work is needed to simplify these explanations for non-experts.

ACCOUNTABILITY AND REGULATION

In 2018, Uber's autonomous vehicle killed a pedestrian—the safety driver was distracted, and

the AI didn't recognize the obstacle. No entity took full responsibility.

Legal frameworks must define accountability hierarchies. The EU AI Act proposes a risk-based approach—requiring documentation, audits, and human oversight for high-risk systems.

HUMAN DIGNITY AND AUTONOMY

AI used in eldercare or mental health chatbots (e.g., Woebot) offers companionship but may lack empathy or exacerbate isolation. Ethical AI must preserve human dignity by ensuring meaningful human interaction in sensitive areas.

GLOBAL EFFORTS AND FRAMEWORKS

UNESCO AND OECD GUIDELINES

UNESCO's 2021 Recommendation on the Ethics of Artificial Intelligence is the first global normative instrument on AI ethics, adopted unanimously by 193 member states. It emphasizes human rights, dignity, and environmental sustainability, and encourages nations to regulate AI through legislative frameworks, capacity- building, and inclusive policymaking. It calls for banning social scoring and mass surveillance systems and promotes ethical impact assessments before AI system deployment.

The OECD AI Principles (2019), adopted by over 40 countries, provide a foundational framework emphasizing human-centered values such as transparency, robustness, safety, and accountability. These principles also recommend public-private collaboration and open government data strategies to ensure trustworthy AI systems.

EU ARTIFICIAL INTELLIGENCE ACT

Proposed in 2021, the EU AI Act is the first legal framework specifically targeting AI systems. It categorizes AI into four risk tiers:

Unacceptable risk

Applications like social scoring and real-time remote biometric identification in public spaces.

- **High risk**: Systems in critical sectors such as healthcare, education, and law enforcement (e.g., CV-screening, biometric ID).
- **Limited risk**: Applications like chatbots, requiring transparency obligations.
- **Minimal risk**: Systems like spam filters with negligible impact. High-risk systems must undergo conformity assessments, maintain detailed documentation, ensure human oversight, and establish risk mitigation strategies. Non-compliance may lead to penalties up to €30 million or 6% of global turnover.

National Strategies India's NITI Aayog initiative, #AIforAll, promotes inclusive and equitable AI deployment across agriculture (e.g., precision farming), healthcare (e.g., AI-based diagnostics), and education (e.g., adaptive learning platforms). It also emphasizes the development of indigenous AI capabilities and ethical guidelines.

Canada and France co-founded the **Global Partnership on AI (GPAI)**, a multistakeholder initiative launched in 2020 to bridge the gap between theory and practice in AI governance. GPAI prioritizes research on responsible AI, data governance, and pandemic response using AI.

China's New Generation AI Development Plan (2017) aims to make China a global AI leader by 2030, with significant investments in AI infrastructure, education, and military applications. While criticized for surveillance-heavy implementations, it showcases a centralized model of AI governance.

Corporate and Civil Society Initiatives IBM's "Everyday Ethics for AI" outlines five principles: explainability, fairness, robustness, transparency, and accountability. It provides internal ethics review protocols and publishes AI FactSheets detailing system behavior and limitations.

The Algorithmic Justice League (AJL), founded by Joy Buolamwini, advocates for algorithmic equity and transparency. It conducts audits, public awareness campaigns, and lobbies for federal regulation to prevent algorithmic discrimination.

OpenAI has proposed cooperative AI development models, emphasizing collective benefit, technical safety, and alignment with broadly shared human values. Microsoft's Aether Committee and Google's AI Principles also represent corporate attempts to embed ethical oversight mechanisms into R&D cycles.

RECOMMENDATIONS FOR ETHICAL AI

1. ***Data Diversity*** – Ensure training datasets are demographically representative to prevent bias propagation. Diverse data improves generalizability and reduces the risk of systemic discrimination in AI-driven outcomes.
2. ***Transparency Mandates*** – Require model explainability, audit logs, and version control for deployed systems. Regulatory bodies should mandate disclosure mechanisms for how AI decisions are made, especially in high-stakes domains.
3. ***Human-in-the-loop Systems*** – Embed human oversight for safety-critical applications like medical diagnosis, autonomous driving, and criminal justice. This reduces the risk of harm from fully autonomous systems and reinforces accountability.
4. ***Accountability Structures*** – Establish clear liability frameworks for algorithmic harm, including mandatory ethical impact assessments, redress mechanisms, and oversight committees to ensure compliance with ethical standards.
5. ***Ethical AI Education*** – Integrate AI ethics into university curricula, professional development programs, and corporate onboarding processes. Engineers and decision- makers must be trained in ethical

reasoning, bias identification, and risk mitigation.

6. ***Inclusive Policymaking*** – Involve underrepresented communities, ethicists, and civil society in shaping AI policy. Participatory design ensures that the voices of marginalized groups are reflected in algorithmic governance.
7. ***Global Collaboration*** – Harmonize international regulations to minimize ethical arbitrage. A global governance framework can help ensure that AI systems developed in one jurisdiction do not exploit legal loopholes in another, promoting fairness and accountability worldwide.

CONCLUSION

AI is not inherently good or bad, it reflects the values, intentions, and governance of those who design, develop, and deploy it. As its adoption continues to expand at an unprecedented pace, it becomes imperative to move beyond reactive approaches and adopt proactive, systemic integration of ethics throughout the AI development lifecycle. Ethical AI is not simply about preventing harm; it is about designing systems that are fair, transparent, accountable, inclusive, and ultimately beneficial to society.

The global nature of AI deployment necessitates cross-border collaboration and harmonized regulatory frameworks. National strategies must be accompanied by enforceable legal standards, public education campaigns, and clear accountability structures. Stakeholders from diverse sectors—governments, corporations, academic institutions, civil society organizations, and affected communities—must engage in sustained dialogue and shared decision-making.

As highlighted through this paper, successful implementation of ethical AI principles hinges on embedding ethical foresight into technical design, ensuring data representativeness, and integrating human oversight in high-stakes domains. Moreover, fostering public trust will require transparency in both AI capabilities and limitations, particularly in areas like predictive policing, healthcare diagnostics, and financial decision-making.

In conclusion, the challenge before us is not whether AI will shape society, but whether society will shape AI. The transformative potential of artificial intelligence can be a force for global good—driving innovation, enhancing well-being, and expanding access to knowledge—if grounded in human rights, democratic governance, and inclusive ethical norms. The time to act is now, before AI's trajectory becomes entrenched in opaque systems and unequal power structures. Ethical AI is not a constraint; it is the foundation for sustainable, equitable progress in the age of intelligent machines. It reflects the values of those who create and deploy it. As adoption accelerates, embedding ethical considerations throughout the AI lifecycle becomes essential. The path forward requires proactive collaboration among governments, corporations, academia, and civil society to co-develop enforceable, inclusive, and adaptive governance structures. Only then can AI serve as a tool for human empowerment and global progress— rather than deepen inequality or erode fundamental rights.

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SOCIO-ECONOMIC CHALLENGES & LIVELIHOOD STRATEGIES OF THE NEPALI COMMUNITY IN DHEMAJI DISTRICT OF ASSAM: A EXPLORATIVE STUDY

DR. RANU PARIYAR
DR. BHABAGRAHI PRADHAN

ABSTRACT

The Nepali community in Dhemaji district of Assam faces significant socio-economic challenges shaped by environmental vulnerabilities and systemic marginalization. This study examines their primary occupations, land ownership patterns, economic marginalization, government policies and coping mechanisms against floods in the Brahmaputra Valley. Using a mixed-methods approach, including semi-structured interviews with 50 Nepali households and statistical analysis of the research revealed that, agriculture (60%) and dairy farming (25%) dominate livelihoods, while wage labour and out-migration supplement incomes. Land alienation affects 70% of house- holds, exacerbating poverty with government policies offering limited support. Flood coping mechanisms include elevated homesteads and crop diversification, yet these are constrained by resource scarcity. Statistical analysis highlights significant correlations between land ownership and income stability ($p < 0.05$). The study recommended policy interventions like flood-resilient agriculture and land tenure reforms to enhance livelihood security.

Associate Professor, Department of Education, Dhemaji Commerce College, Assam

Associate Professor, Department of Education, NCERT, New Delhi.

KEY WORDS: Socio-economic challenges, agrarian economy, livelihood, Nepali community

1.1. INTRODUCTION

The Nepali community in Dhemaji, Assam, is a significant immigrant group with historical roots dating back to the 19th century, contributing to the region's agrarian economy. The geographical area Dhemaji, located in the flood-prone Brahmaputra Valley, faces recurrent environmental challenges that exacerbate socio-economic vulnerabilities (1).

With population of approximately 686,133 (2011 Census), the district's economy relies heavily on agriculture, yet floods, land alienation, and limited institutional support hinder sustainable livelihoods, particularly for marginalized groups like the Nepalis (4). This study investigates the socio-economic challenges and livelihood strategies of the Nepali community in Dhemaji, focusing on: (1) their primary occupations (agriculture, dairy farming, wage labor); (2) land ownership patterns, economic marginalization, and the impact of government policies; and (3) coping mechanisms against floods and environmental challenges. The research addresses the following questions: What are the dominant livelihood activities? How do land ownership and government policies shape economic outcomes? What strategies mitigate flood impacts? By combining qualitative insights with statistical analysis, this paper contributes to understanding the resilience and challenges of the Nepali community.

1.2. OBJECTIVES OF THE STUDY

There are some major objectives to be stated in this study as given below:

- To study the socio-economic status of Nepali community in Dhemaji district of Assam
- To decipher the challenges are facing by the Nepali community in Dhemaji district of Assam
- To Identify the present need and importance of their livelihood of Nepali community in Dhemaji district of Assam

1.3. SOCIO-ECONOMIC CHALLENGES:

- **Limited access to resources and infrastructure:** Many villages lack proper market infrastructure, limiting economic opportunities for local vendors and inconveniencing villagers who have to travel long distances to purchase essential goods.

- **IMPACT OF NATURAL DISASTERS:**

  Dhemaji is prone to flooding and siltation, which destroy houses and agricultural land, impacting livelihoods. The lack of land documents (Patta) for some families also hinders them from receiving compensation for losses due to development projects.

- **LIMITED ACCESS TO CREDIT AND SUPPORT:**

  Households face difficulty in affording essential services like healthcare without borrowing money, highlighting financial constraints. Accessing formal credit for starting or expanding businesses, like dairy farming, can be challenging due to financial barriers.

- **DEPENDENCE ON TRADITIONAL AGRICULTURE:**

  Many households are dependent on agriculture, which is susceptible to unpredictable floods and siltation, making them vulnerable. A lack of knowledge regarding cultivation in sandy soil hinders the adoption of new livelihood strategies in sand-casted areas.

- **EDUCATION AND SKILL DEVELOPMENT:**

  While literacy rates might be higher among Nepali households, access to quality education, particularly in rural areas, can be limited due to insufficient infrastructure, lack of trained teachers, and inadequate teaching materials, according to neadsassam.org. The absence of formal education and skill development restricts the Nepali community's access to better employment opportunities, perpetuating reliance on traditional livelihoods and contributing to out-migration.

- **ACCESS TO BASIC SERVICES:**

  Access to financial institutions and credit is limited, making it difficult for the community to invest in livelihood activities or cope with economic shocks, according to the District Disaster Management Plan Dhemaji District, Assam. Access to quality healthcare services and facilities needs improvement, particularly for vulnerable groups like the elderly who might be more susceptible to health issues and abuse.

- **LAND OWNERSHIP AND RIGHTS:**

A study on Nepali farmers' rights in Nepal indicates a history of landlessness and dependency on higher caste households, suggesting a potential parallel with the land ownership issues faced by Nepalis in Dhemaji. Illegal land encroachment, particularly in areas like Habung can negatively affect the Nepali community residing there.

2.0. METHODOLOGY:

Study Area: The present study encompassed the challenges of Nepali community in Dhemaji district of Assam. This district lies in the Brahmaputra valley which is affected by annual flooding and riverbank erosion. The Nepali community concentrated in rural areas like Gogamukh and Jonai. They are significantly minority and engaged primarily depend upon agriculture.

2.1. DATA COLLECTION

A mixed-methods approach was employed. Semi-structured interviews were conducted with 50 Nepali households, selected via purposive sampling to ensure diversity in age, gen- der, and occupation. Interviews explored occupations, land ownership, economic challenges, government policy impacts, and flood coping strategies. Secondary data from government reports, census data, and studies (4; 5) provided context. Quantitative data on income, land ownership, and flood impacts were collected via a structured survey from the same household.

2.2. DATA ANALYSIS& RESULTS:

Qualitative data were analyzed using thematic analysis to identify key themes. Quantitative data were processed using descriptive statistics (means, percentages) and inferential statistics (chi-square tests, correlation analysis) to examine relationships between land ownership, income, and flood impacts. Statistical analysis was done with using SPSS. Ethical considerations included informed consent and anonymity.

3.1. STATISTICAL ANALYSIS:

Descriptive statistics (Table 1) summarize occupational distribution and income. A chi- square test ($\chi^2 = 9.84, p < 0.05$)
indicates a significant association between land ownership and primary occupation, with landowners more likely to engage in agriculture. Correlation analysis shows a positive relationship between land ownership and income stability ($r = 0.62, p < 0.05$).

3.2. RESULTS:

The results primarily focus on Dhemaji's general socio-economic context and the challenges faced by local communities, including the Missing tribe, who share similar experiences with the Nepali community. More specific research might be needed to develop deeper into the unique socio-economic situation and livelihood strategies of the Nepali community in the region.

4.0. PRIMARY OCCUPATIONS

The Nepali community relies heavily on agriculture, dairy farming, and wage labor :

- Agriculture: 60% of households (30/50) engage in subsistence farming, cultivating rice, maize, and vegetables. Floods reduce yields by 40–50% annually.
- Dairy Farming: 25% of households (12/50) rear cattle for milk production, con- tributing 20–30% to household income.
- Wage Labor and Out-Migration: 15% of households (8/50) depend on daily wage labor, with 10% of adult males migrating to urban centers for construction or retail jobs.

4.1. LAND OWNERSHIP AND ECONOMIC

Marginalization Land ownership patterns reveal significant challenges: 70% of households (35/50) lack legal land titles due to historical alienation and flood-induced displacement. 65% of households live below the poverty line (income < 12,000/month, P.C., Govt. of India. Economic marginalization is exacerbated by limited access to credit (80% of house- holds lack formal banking access) and low literacy rates (55% among adults).

4.2. GOVERNMENT POLICIES

· Government interventions, such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and flood relief programs, provide limited support:

- Only 30% of households accessed MGNREGA work (100 days/year), citing bureaucratic delays.
- Flood relief (e.g., food aid) reaches 40% of households but is inadequate for long term recovery.

COPING MECHANISMS FOR FLOODS

- The Nepali community employs several strategies to mitigate flood impacts:
- Elevated Homesteads: 50% of households construct raised platforms to protect homes and livestock.
- Crop Diversification: 40% cultivate flood-tolerant crops like deep-water rice.
- Community Networks: 60% participate in labor exchange and mutual aid during floods
- Temporary Migration: 20% of households relocate to safer areas during peak flood seasons.

LIVELIHOOD STRATEGIES

- **Agriculture:** Many Nepali households rely on agriculture, particularly sali rice cultivation and vegetable farming, as their primary source of income. They value suitable land availability and potential for year-round production.
- **Livestock Rearing:** Piggery, poultry, dairy, and goatery are also popular livelihood choices, driven by high market demand. However, high prices for improved livestock breeds can be a barrier for some.
- **Weaving:** Weaving is another chosen livelihood activity, also driven by market demand.
- **Off-farm Employment:** Some individuals are involved in wage labour, service sectors, or retail, providing alternative income streams.
- **Resilience and Adaptability:** The community demonstrates resilience in coping with floods and erosion by using traditional techniques like raising house floors, shifting houses, constructing guard walls, and

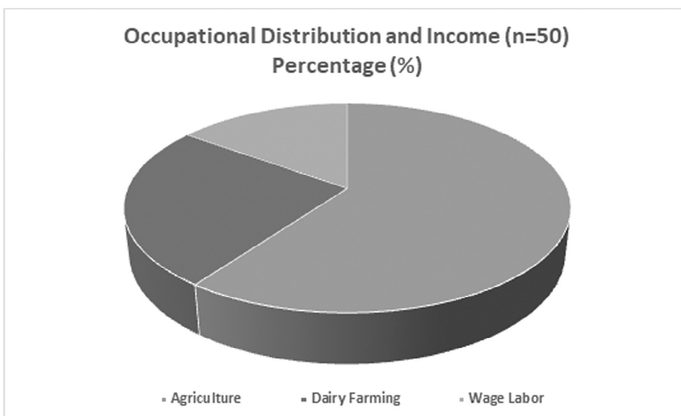
changing crop calendars.

- **Seeking Alternative Opportunities:** Faced with agricultural setbacks, some are exploring other avenues like fishing and various agricultural practices, including those learned from others, to maintain their livelihoods.

Table 1:

Occupational Distribution and Income (n=50)

Occupation	Percentage (%)	Average Monthly Income ( )
Agriculture	60	8,000
Dairy Farming	25	10,500
Wage Labor	15	6,500



DISCUSSION:

The Nepali community's reliance on agriculture and dairy farming reflects their agrarian roots but exposes them to flood-related risks, with annual crop losses significantly impacting income (1). Dairy farming offers a stable income source, yet limited access to markets and veterinary services constrains scalability (5). Wage labor and out-migration, while common, yield low returns due to the informal nature of jobs, mirroring trends in Nepal (3). Land alienation, affecting 70% of households, is a critical barrier, restricting access to credit and agricultural inputs. This aligns with historical patterns of marginalization among immigrant communities in Assam (5). Government policies like MGNREGA provide temporary relief but fail to address structural issues like land tenure or flood resilience. Coping mechanisms, such as elevated homesteads and crop diversification, demonstrate resilience but are resource-intensive, limiting their adoption among poorer households (6).

Statistical findings underscore the link between land ownership and economic stability, suggesting that secure tenure could enhance livelihood outcomes. Policy interventions should prioritize :

- Flood-Resilient Agriculture: Promote flood-tolerant crops and elevated seed stor- age.
- Land Tenure Reforms: Legalize land titles to improve access to credit and resources.
- Skill Development: Train youth and women for non-farm livelihoods to reduce agricultural dependency.

EXPECTED SOLUTIONS AND PROMOTING SUSTAINABLE LIVELIHOODS:

- **Diversification of livelihoods:** Encourage and support the development of alternative and innovative livelihood options beyond traditional agriculture, according to the Assam State Disaster Management Authority.
- **Skill development and vocational training:** Provide relevant skill development and training in emerging sectors to equip the youth with better employment opportunities within the state.
- **Support for dairy farming:** Improve access to financial assistance, modern techniques, and markets for dairy farmers to enhance productivity and income.
- **Government Schemes and Initiatives:** The government's focus on empowering tribal communities, like the PMVDY (Pradhan Mantri Van Dhan Yojana) and the "Trissam" brand initiative, can also benefit the Nepali community by promoting entrepreneurship, skill development, and market linkages for locally produced goods.

- **Improving Access to Education and Healthcare:**
- **Addressing School Infrastructure and Quality:** Prioritize improving infrastructure, teacher training, and availability of teaching materials in schools,especially in venture schools, according to neadsassam.org.
- **Community-based initiatives:** Promote and support community-led initiatives aimed at improving educational outcomes, such as providing private tutoring or after-school programs.
- **Addressing Healthcare Disparities:** Invest in improving healthcare infrastructure and services in rural areas, ensure access to affordable and quality healthcare for all, and implement measures to address issues like elderly abuse.
- **Ensuring Land Rights and Addressing Encroachment:**
- **Implement and Strengthen the Forest Rights Act (FRA) of 2006:** This act grants land rights to forest-dwelling communities and its effective implementation can secure land ownership for Nepali communities living near or within forest areas.
- **Resolving Land Disputes and Encroachment Issues:** Address land disputes and encroachment through fair and transparent processes, ensuring the protection of legitimate land rights.
- **Empowering the Community:**
- **Community participation:** Encourage and facilitate community participation in decision-making processes, particularly in projects and initiatives that directly affect them.
- **Promoting inclusivity:** Focus on creating an inclusive environment through awareness programs and stakeholder engagement to foster greater ownership and participation from community members.

CONCLUSION:

The Nepali community in Dhemaji faces intertwined socio-economic challenges, including flood-induced disruptions, land alienation, and limited policy support. Their primary occupations—agriculture, dairy farming, and wage labor—are constrained by environ- mental and systemic factors, with

70% of households lacking land titles and 65% below the poverty line. Coping mechanisms like elevated homesteads and crop diversification reflect adaptability but require institutional support for scalability. Statistical analysis confirms the critical role of land ownership in income stability. Targeted interventions, including flood-resilient agriculture, land reforms, and skill development, are essential for sustainable livelihoods and socio-economic inclusion. In conclusion, a multi-faceted approach involving government intervention, community-led initiatives, and partnerships with local organizations is essential to address the socio-economic challenges faced by the Nepali community in Dhemaji, Assam and ensure their overall well-being and development. Future research should explore longitudinal impacts of these strategies and the eûicacy of policy interventions.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN EDUCATION

DEBABRAT SENAPATI,
DR. NIKHIL HAZARIKA

ABSTRACT

Artificial Intelligence (AI) represents a transformative technology that is being utilized to tailor the experiences of diverse learning groups, educators, and tutors. It is regarded as the most sought-after technology in the contemporary education landscape. There is an expectation that AI will significantly improve the global education system. Currently, educational institutions are encountering numerous challenges, such as elevated dropout rates, a lack of smart content, insufficient customized materials aligned with textbooks, inadequate personalized learning systems, and rigid examination formats, among others. The implementation of AI offers a promising solution to address these issues. It aids in crafting personalized learning experiences, developing intelligent content, broadening educational access, and enhancing the management and administration of education by integrating information and distributing data according to the specific needs of the target audience. With the assistance of AI, educators can discern the learning styles and difficulties faced by students, thereby providing innovative teaching methods and support. This study explores the role of AI across various educational

Research Scholar, Library and Information Science, Madhabdev University, Narayanpur, Assam.
University Librarian (i/c), Central Library, Madhabdev University, Narayanpur, Assam.

domains and its application within the Indian education system. AI holds the potential to empower students in achieving their objectives and optimizing the educational process. It can analyze students' prior learning experiences, pinpoint their weaknesses, and enhance future learning opportunities for tailored educational experiences. Furthermore, AI can be effectively employed for transcribing faculty lectures into local languages, thus serving as a valuable educational resource for students in technical fields. The inclusive nature of AI tools and programs ensures that classrooms are accessible to all, regardless of language barriers or other disabilities.

KEYWORDS: Artificial Intelligence (AI), Education, Technical Education, Indian Education

1. INTRODUCTION

In the realm of Information and Communication Technologies (ICT) has, now-a-days, become an integral part of our everyday existence. In recent decades, ICT has significantly altered the methods and practices across various sectors of business and governance. Its influence in education is emerging, albeit not as profoundly as in other fields. The primary objective of integrating ICT into education is to foster innovative teaching and learning methodologies while cultivating 21st-century cognitive and learning abilities. The application of ICT in educational settings guarantees the effective utilization of all technologies, equipping both students and educators with the necessary skills to navigate these tools proficiently. When teachers incorporate ICT into their classrooms, it enhances students' motivation to learn effectively. The National Education Policy (NEP) of 2020, which is the first educational policy of India in the 21st century, has appropriately recognized the prospective influence of disruptive technologies on the educational framework. In a knowledge environment driven by technology, it is essential to familiarize oneself with various disruptive technologies such as Artificial Intelligence, Block chain Technology, Machine Learning, and Data Science, among others. These disruptive technologies are poised to affect all facets of education, including technical education, teacher training, vocational education, professional education, and adult education. In India, technical education is crucial for the development of human resources, as it generates skilled labor, boosts industrial productivity, and enhances the quality of life for individuals. It encompasses a range of programs, including engineering, technology, management, architecture, urban planning, pharmacy, applied arts and crafts, as well as hotel management and catering technology.

The NEP 2020 emphasizes the importance of providing professional education within higher education. Additionally, it recommends that technical Universities in India strive to evolve into multidisciplinary institutions that can deliver comprehensive and interdisciplinary education. The policy further asserts that India should take the initiative in training professionals in fields such as “Artificial Intelligence (AI), 3-D machining, big data analysis, and machine learning.” Consequently, AI is emerging as a pivotal force for development and innovation, impacting not only various industries but also multiple educational sectors. Over the next three years, Learning Management Systems will be enhanced with AI capabilities, and AI-driven applications will work more collaboratively to elevate the quality of the educational system. As a result, artificial intelligence software is expected to become progressively more sophisticated in everyday life.

2. ARTIFICIAL INTELLIGENCE

In recent years, artificial intelligence (AI) has led to significant advancements and is recognized as a developing technology that will revolutionize human existence. Since the 1950s, experts have periodically forecasted that society would need to wait several more years to achieve Artificial General Intelligence. This system is expected to exhibit behavior indistinguishable from that of humans in all facets, including cognitive, emotional, and social intelligence. In 1955, the inaugural AI system, known as Logic Theorist, was created by Allen Newell and Herbert A. Simon, with implementation carried out by J. Clifford Shaw. The term ‘artificial intelligence’ was first introduced by John McCarthy in 1956. Various researchers have provided definitions for this term. For instance, Baker, T., & Smith, L characterizes AI as "computers capable of performing cognitive tasks typically associated with human intellect." The researchers further clarify that AI is not a singular technology but an overarching term that encompasses a variety of technologies, including machine learning (ML), data mining, and natural language processing. AI can be described as the development of intelligent machines that emulate human behavior and responses. It also pertains to the capability of computer-controlled machines to perform tasks in a manner closely resembling that of humans **(Shabbir, J.)**. Moreover, **Popenici, S. A. D.** posited that existing literature definitions predominantly emphasize cognition while neglecting other dimensions such as political, psychological, and philosophical considerations related to the theory of intelligence. The researchers define AI as "computing systems that can engage in human-like processes such as learning, adapting, synthesizing, self-correction, and utilizing data for complex processing tasks."

Artificial Intelligence has the capability to assist students in reaching their objectives and optimizing the educational process. It grants students access to suitable courses, enhances their communication with faculty members, and allows them to concentrate on other life aspects by conserving their time. A significant feature of AI is its ability to personalize learning, enabling students to adopt a tailored approach based on their distinct abilities, preferences, and experiences. AI adjusts to the students' knowledge level, learning pace, and desired goals, ensuring that they derive the utmost benefits from their education. Furthermore, AI can evaluate students' past learning experiences, pinpoint their weaknesses, and enhance future learning opportunities for a customized educational experience. It also empowers faculty by automating various tasks such as administrative duties, grading papers, and assessing learning patterns. According to **Southworth, P** faculty members spend 31% of their time planning future lessons, grading assessments, and engaging in various administrative tasks. The implementation of AI and automation tools will enable faculty to streamline their work, allowing them to allocate the time saved to other essential teaching competencies **(Karandish, D).** The application of AI can provide constructive feedback to faculty, assisting them in refining their instruction and making learning more enjoyable and engaging. Additionally, it will aid students in recognizing their errors and learning how to improve by correcting those mistakes.

The swift advancement of computing technologies has facilitated the integration of AI in Education. The implementation of AI technologies or application programs within educational environments to support teaching, learning, or decision-making is known as AI in Education **(Hwang, G. J., et.al)**. AI also has the capability to address various educational requirements of students. AI and ML are technologies that not only enhance the safety of educational institutions but also boost the efficiency of an educational system by contributing to the teaching and learning process **(Kuleto, V., et.al).** Therefore, AI is considered to have a significant impact on fostering educational reforms. It will equip educational institutions with innovative teaching tools, generate new modes of teaching and learning, and promote innovation in teaching assessment and management systems **(Liu, Y., et.al)** . It assists teachers in creating intelligent content for students, which facilitates learning and enhances comfort. The intelligent content can dynamically change and adapt, depending on the reader. It aids in generating and updating lesson content, ensuring that the information remains current. It also customizes the content for various learning trajectories. Furthermore, it empowers students to access knowledge with a single click, enriching their understanding and broadening their knowledge base to align with the needs of 21st century learners. AI-powered chatbots are available to students for their inquiries at all times. They assist in providing answers to questions without requiring students to wait for the teacher in the physical classroom. The purpose of chatbots in education is to support teachers rather than replace them. They alleviate the burden of repetitive and low cognitive tasks performed by teachers, thereby increasing their productivity **(Vijaya Lakshmi, et.al)**. The chatbots enable colleges to respond to student inquiries at an exceptionally fast pace, fostering motivation and interest among students in their learning.

3. INTEGRATION OF AI IN EDUCATION

The NITI Aayog discussion paper titled “Responsible AI” (2021) has underscored Education as a sector with considerable potential for addressing societal challenges through AI. It further elaborates on the prospective applications of AI in Education, claiming that AI can enrich students’ learning experiences through personalized education and assist in predicting the need for interventions aimed at reducing dropout rates (**Kasinathan, G.**). Various AI technologies, including chatbots, adaptive learning platforms, and virtual teaching assistants, are being employed by educational institutions to boost their efficiency and effectiveness. A relationship exists between AI and education, which primarily involves three key areas: ***1) “Learning with AI***,” which refers to the use of AI-powered tools in educational settings; ***2) “Learning about AI,”*** which emphasizes AI technologies and their techniques; and ***3) “Preparing for AI,”*** which prepares individuals to better understand the potential impacts of AI on human lives **(UNESCO)**. The implementation of AI in education makes learning universally accessible to all students. It is particularly advantageous for students living in remote areas and for those unable to attend physical classes due to health issues or injuries. The integration of AI in education eliminates geographical barriers to education, empowering students to learn from top educators worldwide while remaining at home. It also aids teachers in identifying deficiencies in their teaching methods and content. ***Coursera***, a platform for MOOCs, has already put this into action. Adaptive learning is regarded as one of the most promising uses of AI in education. It tracks each student’s progress and provides vital information to teachers when students struggle with the learning material. Additionally, adaptive learning customizes the educational content based on students’ needs, enabling them to learn at their own pace and convenience. In higher education institutions (HEIs), AI-powered systems are being utilized to reduce human bias in the admissions process, thereby enhancing the credibility of the admission procedures. It strengthens the credibility of the admission process by outlining specific criteria for selecting applications in admissions. AI tools contribute to making global classrooms accessible to all students; irrespective of the language they use **(Marr, P)**. The AI tools and programs are inclusive, which ensures that classrooms are accessible to everyone, regardless of language or any other barriers.

4. ROLE OF AI IN THE EDUCATION SECTOR OF INDIA

Many academic institutions in India have embraced AI. These include the Centre for Excellence in AI (CAI) at IIT Kharagpur, the Centre for AI and Robotics (CAIR) linked with DRDO, the Robert Bosch Centre for Data Science and AI (RBC-DSAI) at IIT Madras, the AI Group (AI@IISc) at IISC Bangalore, and the Department of AI at IIT Hyderabad. In August 2021, the Ministry of Education (MOE), Government of India, initiated the ***"AI for All"*** program in collaboration with Intel and CBSE. The primary objective of this initiative was to raise awareness of AI among the citizens of India. The *"AI for All"* program is a self-directed online course designed to foster understanding of AI. This self-learning initiative targets individuals such as students, professionals, and senior citizens. The program aims to engage users who aspire to adopt a 'Digital First Mindset'. According to a survey conducted by Analytics Insight, 46% of respondents believe that AI can predict school dropout rates in India, while 24.4% do not consider it a viable option. Among the surveyed individuals, 29.3% remained neutral. Furthermore, 65.9% of participants felt that AI could improve the effectiveness of personalized education, and 31.7% believed that AI models could enhance personalized learning, whereas 2.4% disagreed with the notion that AI could improve personalized education. Approximately 34.1% of participants believed that AI educational applications assist in covering their syllabus at home. However, 65.9% of respondents do not utilize AI educational applications.

In another survey carried out by Analytics Insight to explore the attitudes of Indian people towards AIED and their readiness for its implementation, approximately 241 individuals participated. About 90.2% of the respondents believed that parents and students are informed about AI, while 9.8% are not. Roughly 39% of individuals think that AI will have a considerable effect on education, as it will provide new insights into the education of both children and adults. Merely 4.9% of participants are entirely negative, believing that

AI will not contribute to educational progress. When participants were inquired about AI tools and technologies, around 46.3% described the level of AI usage as low. However, 2.4% of participants felt that AI usage was extensive. Concerning the use of AI in schools, 12.2% of participants believed that AI usage is low, while 31.7% of participants remained neutral.

Recent technological innovations based on Artificial Intelligence (AI) have demonstrated that AI is set to continue playing a crucial role in the education system and may even become more significant. AI enhanced solutions have inspired schools and universities to adopt a technology-focused approach to education. Additionally, it has become a new tool for educators, helping them with administrative tasks. To explore the future of AI in Indian education, another specific study was conducted by Analytics Insight. Approximately 41.5% of participants were uncertain about whether AI could replace teachers in the future. Meanwhile, 36.6% believed that AI would never replace teachers, and 22% were of the opinion that AI would definitely replace a teacher in the future. Participants were asked if they thought AI could become the future of education in India. Around 46.3% believed that AI would be the leading technology driving the Indian education sector in the near future. Additionally, about 41.5% of participants were unsure about the implementation of AI in education. Finally, around 12.2% of respondents believed that AI would not take over the Indian education system in the near future.

5. ARTIFICIAL INTELLIGENCE IN TECHNICAL EDUCATION

In a similar vein to impact of AI on education, it is believed that AI will also enhance the quality of technical education. *The Indian Journal of Technical Education, Vol. 45, No 3 July - September, 2022* 15 notes that the All India Council for Technical Education (AICTE), the regulatory authority for technical education, has recommended that educational institutions nationwide offer AI as an elective in B.Tech. programs and initiate B.Tech. degrees in AI and Data Science. According to the reports from AICTE, since 2019-24 academic years, at least 127 diploma institutions and 663 undergraduate colleges across India have chosen to implement courses in "AI, Data Science & Analytics, block chain, machine learning and robotics." The

127 institutions out of 222 institutes focused on AI and machine learning, as well as 186 institutes dedicated to AI and data science. AI is not only relevant for technical education courses but can also enhance education management and delivery. It has the potential to empower educators and improve learning outcomes and assessment methods. Additionally, AI offers significant opportunities for lifelong learning. The NEP 2020 highlights the importance of creating teaching materials in local languages, and AI can effectively transcribe faculty lectures, making them valuable educational resources for technical students. Furthermore, chatbots can be utilized in technical education to track student enrollment and retention, as well as to analyze the progress metrics of students.

6. CONCLUSION

While the future role of Artificial Intelligence (AI) in Education is not completely outlined, it is believed that in the coming years, nearly every aspect of education—whether it is technical, professional, or non-technical—will increasingly depend on technologies and tools designed to create a well-rounded learning environment for students and educators as well. Every day, innovative AI tools are being introduced, and it is expected that these advancements will aid students in effectively planning their career paths and striving to achieve their aspirations. AI has begun to showcase its benefits and potential in diverse educational environments, and it remains to be seen how this technology will empower and enhance the overall learning experiences of students.

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NATURE AND NARRATIVES: EXPLORING ECOLOGY IN INDIAN LITERARY LANDSCAPE

DR RUPJYOTI BHATTACHARJEE

ABSTRACT

Literature is related to almost all segments of study that shapes society in one way or the other. It incorporates sociology, anthropology, agriculture, medicine, law , development studies, etc because literature and society are not only mutually exclusive but rather a reflection of one another. So, the concept of green literature and its arterial relation with sustainable development today is significant and has moved from its initial position to the centre of academic discourse. It is fueled by current world interest in the study of literature in relation to environment and ecology. Green literature today has given birth to some exponents who are using literature to celebrate the environmental issues known as ecocritics. Ecocriticism lends itself to setting as an essential element in creative writing. There is no work of arts without a setting that includes the physical environment of the story. It is used for the observation and study of the relationship between literature and earth's environment. It analyses the works of the authors, researchers and poets in the context of environment issues and nature. It helps to a great extent to solve the current environmental issues through literature. Environment has posed a great threat to human society as well as the mother earth. The extensive misuse of natural resources has left

Dept of English, Lakhimpur Commerce College

us at the brink of ditch. The rain forests are cut down, the fossil fuel is fast decreasing, the cycle of season is at disorder, ecological disaster is frequent now round the globe and our environment is at margin. In such circumstances, eco criticism, a new theory of reading nature writing came into existence. This worldwide emergent movement is a reaction to man's anthropocentric attitude of dominating nature. The present paper seeks to explore the ecocritical perspectives as envisaged in some selected Indian writing in English .An attempt will be made to explore how this environmentally oriented study of literature brings about an ecological literacy among the readers who in the process become eco-conscious and take tender care of Mother Nature. Using it as an interpretive tool, the study will focus on nature writing which is commonly associated with Environmental criticism , Green Cultural Studies, Deep Ecology and Ecofeminism.

Keywords: Environment, Green Studies, Eco Criticism, Literature, Ecology and Literary Discourse.

INTRODUCTION

Ecocriticism defines the relationship between literature and the physical environment. William Rueckert in 1978 was the first person to use the term with an objective to suggest that ecological terms and concepts can usefully be applied to the study of literature. This, however, is a general term for the study of the relationship between literature and the natural environment. Critics like Leo Marx and Raymond Williams have considered the importance of the environment in literature. In the late 1980s and early 1990s it became a recognizable sub-branch of literary and cultural studies probably because the environment itself became an urgent concern at large. Eccritics want to discuss nature in literature to raise awareness more generally about the need for concerning the environment. Ecocriticism can be described as a practice of reading literature from nature centered perspective .Eco poetics, green culture and environmental literary criticism are some popular names for this relatively new genre. This study has invoked the interest of scholars worldwide. It emphasizes on literature and theoretical approach to the interrelations of nature, culture and the different elements in nature.

OBJECTIVES

To analyze the ecocritical perspectives in Indian English literary texts. To explore how literature can shape ecological consciousness and promote environmental ethics.

To study literary depictions of environmental degradation and sustainable practices.

To highlight the contribution of Northeast Indian literature to ecological discourse.

METHODOLOGY

This study is qualitative in nature and is based on textual analysis. It relies on secondary sources such as critical essays, scholarly articles, books, and credible online resources. Select Indian literary texts have been analyzed through an ecocritical lens to understand their thematic relevance and contribution to environmental awareness.

LITERATURE REVIEW

The field of ecocriticism has witnessed significant development since its formal recognition in the late 20th century. Foundational texts such as The Ecocriticism Reader (Glotfelty & Fromm, 1996) and Rueckert's essay "Literature and Ecology" (1978) set the tone for reading literature through an environmental lens. Scholars like Lynn White Jr., in his seminal article "The Historical Roots of Our Ecological Crisis," link ecological degradation to Western anthropocentrism. In the Indian context, Nirmal Selvamony's Essays in Ecocriticism and works by scholars such as Murli Sivaramakrishnan and Ujjwal Jana have foregrounded the role of Indian literature in raising ecological awareness. Indian writers like Tagore, Kamala Markandaya, Arundhati Roy, and Amitav Ghosh have blended traditional ecological wisdom with modern environmental concerns. Meanwhile, voices from the Northeast, such as Temsula Ao and Mamang Dai, offer a unique indigenous perspective grounded in animistic traditions and community-based environmental ethics.

LITERATURE AND NATURE

Literature very often serves as a corrective mirror that brings about drastic changes in society regarding the environmental issues. It consistently attempts to communicate the contemplations and suppositions of the human psyche which are firmly associated with and adapted by the environment. The mirrored image and effect of literature rely upon the surroundings wherein it is placed. If an action on writing is judged through the exception concerning this mirrored image, it is clear that it relies on the excellent characteristic of the surroundings. We live in a society in which we are obliged to conform to social norms regarding how we live, and yet this is within the environment, which leads to evaluation via the environment, i.e., ecocriticism. The topic of writing literature considers the environment in some way or the other. If writing expresses convivial sympathies that are so natural, it exerts a positive impact on our thoughts and mindsets. Literature has shaped the expertise of lifestyles. The environment has posed a great hazard to human society in addition to mother earth. The massive misuse of herbal sources has left us at the edge of the trench. The rainforests are reduced down, the fossil gasoline is rapidly decreasing, the cycle of the seasons is displaced, an ecological disaster is commonplace now around the world and our surroundings are at the margin. Beneath these instances, there arose a concept of reading nature writing over the last decade of the preceding century referred to as eco-grievance. It is a worldwide emergent movement that came into existence as a reaction to man's anthropocentric mindset of dominating nature. This environmental observation of literature brings with it ecological literacy among readers who within the system end up eco-aware, consequently demanding for the natural mother. The environmental issue is topic of discourse today; ecocriticism has fast development in the course of its brief time period since its introduction. It is an interpretive device for studying nature writing, which is normally associated with environmental complaints. Eco or ecological care is concerned with the relationships among residing organisms and their herbal environment, and in addition to the relationships with their environment. The connection between man and nature is not interdependent however they are additionally interrelated.

Through analogy, ecocriticism is involved in the relationships among literature and the surroundings or how man's relationships along with his bodily surroundings are reflected in literature. There was a connection between nature and literature. This relationship has been contemplated via writers and poets from exceptional cultures of the arena. Environment and ecocriticism are the significant aspects for the literary study and research . The close association of literature with nature is evidently portrayed in the works of poets and other writers in the global literary world. The keen relationship between the natural and social world is analyzed and emphasized in the areas of development. The literary critic tries to study how ecology and ecocriticism has been textualized by the writers in their works. Many novels, poems, and other genres of literature are centered around the context of nature-associated troubles. In present era, the environment is a matter of discussion for many disciplines of information and development. Many authors have expressed their views in literature about the cupidity of humans and the growing populace. The ecosystems have been adversely affected due to aggressive acts of mankind. Literature reflects the concern for nature, its changes marking from reverence to destruction. Many poets and novelists have reflected on nature and environmental conscious in their writing.

ECO CRITICAL INDIAN LITERARY TEXTS

Environment is an indispensable part of the human life and it is evident in all principal canonical writings. An ecological insight might also cause them to have several new views. Indian philosophy and writing are not an exception to this. Indian literature is associated with the environmental questions from the ancient to the cyber age . In Modern Age, Ecology, Eco balance, Environmental Concerns have attained paramount importance. Even though nature is represented in literature from ancient times, Environmental awareness has become the modern literature concern. Indian writing in English followed this trend and incorporated these issues in fiction. The literature has become a mode of expression about environment and its importance in human life. The need of the hour is the ecofriendly atmosphere for the proper growth, development, sustainability and prosperity. All these concerns have been projected by Indian writers writing in English These environmental literary works deal with the human–nature relationship and interconnection which is the keynote of eco-literature. Thus, Nature is always a supporting element in literature and can be seen in multitudinous forms reflects various atmospheres, moods, feelings and status. It is an expressive form for literature describing fertile, colorful atmosphere. Nature presents all types of environment through its various elements. The prevalent environment imbalance has ignited the literary figures to use their literary tools for strengthening the attitude of people towards environment protection and eco-balance.

The works of Rabindranath Tagore, Raja Rao, Kamala Markandaya, Anita Desai, Kiran Desai, Jayant Mahapatra, Ramanujan,Bhavani Bhattacharya have used literary texts as a mode of expression about environment and its importance in human life and universe.Ecocritical perspectives may be best perceivedin the writings of Nobel Laureate Rabindranath Tagore.His metaphorical play Rakta Karabi depicts how human greed denies the beauty of nature. **Muktadhara,** one of Tagore's masterpieces reflects the misuse of science for the pursuits of pleasure and comfort. These are thequality examples of ecocritical texts where human atrocities in oppositionto nature are denounced. Kamala Markandaya's **Nectar in a Sievere** presents nature as a destroyer and preserver of existence. The book illuminates the drastic changes in men's life due to his negligent treatment towards nature.The novelist here projected the picture of the evils of industrialization that destroy the sweet harmony of a peasant's lifestyle. Bhabani Bhattacharya has depicted the natural calamity realistically in his popular novel, SoMany Hungers. The book described the Real Bengal famine of 1943 and how it affected people realistically . Bhattacharya used various nature symbols to give a vivid description of this calamity and its effects.In Anita Desai's fiction, nature has a strongpresence. She is famous for introducing psychological novel in Indian English Fiction wheresheuses external landscapes to portray interior state ofmind. In **Cry, the Peacock**, the complexities ofMaya's inner life are effectively brought out throughthe landscape as her resentment against herhusband for his inability to communicate with her.Maya compares herself with the peacock in thejungle. The peacocks are said to fight before theymate, living they are aware of death and dying whenthey are in love with life. This is reflected towardsthe end in the novel, during a dust storm. Bothhusband and wife go up to the roof of their house. She pushes him off the parapet and he dies. In Voices in the City, Monalisa is repeatedly compared to thecaged bird in her house who wants to be free. Hercondition reflects the plight of the imprisoned birdwhose need is no one's concern and its life is for thepleasure of the others. She finally takes her own lifeto free herself.**The God of Small Things**, the masterpiece, of Arundhati Roy deals with the topics of natureand environment. It poignantly depicts the environmental pollution through the description of thechanged condition of beauty, greenery and the look of Ayemenem and the river Meenachal. She has used nature images not only to describe the beauty or glorious atmosphere of theregion and landscape but also for exposing the polluted atmosphere of Ayemenem. Roy contrasts the earlier condition of Meenachal with its later condition. Earlier Rahel feels: It was warm, the water green like reapplied silk. With fish in it. With the sky in it. And at night, the broken yellow moon in it.(**The God of Small Things**,123). But the river, during the childhood of Rahel, has become deformed and repulsive in her adulthood as its charm and effect deteriorated due to environmental pollution. When the adult Rahel visited the river, it was different in look and had lost its inspiringappeal: … the river was no more than a swollen drain now. A thin ribbon of thickwater lapped wearily at the mud banks on either side, sequined with the silver fish. It was chocked with a succulent weed,…(Arundhati Roy, 124). Actually, this is because of the pollution created by the inhabitants and factories of theregion. The novelist tries to show the harmful effect of urbanization on environment and has delineated the picture of beautiful, lively green Ayemenem as well as the polluted and disturbed Ayemenem. By the help of many picture sequences, descriptions of scenery andregion, the degenerated gloomy environment of the region are brought to light. The ecological consciousness in Kiran Desai 's **Hullabaloo in the Guava Orchard** manifests Nature as a source of peace and tranquility and throws ample light on the estranged relationship of man with the environment. In her

TheInheritance of Loss the novelist indicates how Kanchenjunga will pay forthe brutality of human aggression. The global environment crisis has led various people from various regions to voice their concerns towards environment. Last but not the least, Amitav Ghosh's ecological book **The Hungry Tide** is a contemporary story of disjunctions ,dislocations and destabilization .It is apowerful ecocritical text that examines how environment is represented in literature. The chapter **The Ailing Planet** was originally an article written by Nani Palkhivala which was published in the newspaper 'The Indian Express' on November 23, 1994.In this chapter the writer raises an issue towards the exploitation of natural resources and the deteriorating health of the earth. It reflects how the Green Movement helped environmentalists to raise awareness about the harmful condition of the earth and how the movement has been successful in educating people about the conservation of the environment.In 1987, the term Sustainable Development was used by the World Commission on Environment and Development. A zoo in Lukasa, Zambia has a cage in which a sign reads 'The World's most dangerous animal' and inside there is a mirror that gives a message that human beings are the most dangerous animals. Brandt Commission raised a question "Are we to leave our successors a scorched planet of advancing deserts, impoverished landscapes and ailing environment?"The writer also focuses on overpopulation, deforestation and what should be our responsibility towards the environment.

ECOLOGICAL CONCERNS IN WRITINGS FROM THE NORTHEAST

Northeast Indian writings are replete with impressions of nature such as the rivers, mountains, forests, wildlife, etc. and the myriads of ways they are interconnected with the lives and cultures of the people inhabiting these regions. The inhabitant of these regions emphasized on the important role ofnature played in nurturing and sustaining their generations and so were able to learn and practice a way of life in harmony with the natural environment. They "practice an animistic faith that is woven around forest ecology and co-existence with the natural world" (Dai, 2006). Their rituals and practices comprise the tribal cultures entrenched in the lap of nature .The literature of this region is rich in enshrining various aspects of the ecology and celebrate the ecological glory and their ecological awareness of their area. The ruthless act of deforestation and oppression upon the Mother Nature in various ways by destroying the serenity of the nature, obliterating the natural environment, killing rare birds and animals and distorting the landscape and biodiversity, have been sharply reacted upon by these poets. (Chandra and Das 2007, 35)

Modernization, Industrialization, urbanization, excessive exploitation of the natural is adversely altering the harmonious relationship that men once shared with nature. The poets and writers of these regions are very mindful of the deteriorating health of their environments and have employed literature as a medium to lament the damages caused to their vulnerable ecosystems and express their apprehensions about the impending apocalypse. TemsulaAo's poems reflect vehement reactions against humans' ruthless acts of ravaging the environment. She wrote on the endangered environment from an ecocritical perspective and exemplified how literature can be instrumental in salvaging nature from an imminent crisis. Ao served as a custodian of her culture and as an environmentalist she shouldered the responsibility of preserving her oral traditions and cultural heritage and salvaging them from the invasive forces of modernization through the mode of writing. GJV Prasad states, "Temsula Ao sings of her landscape, one that is often an objective correlative for her mindscape and even more for the community's ecology – the changes in the land reflect the damage done to her people, their rootlessness (a sense of uprootedness), their wounds and pains" (Prasad 2013, xvii). In her poem **Lament for an Earth** (Ao 2013, 42-44) Ao tries to reflect her heartfelt anguish and concern for the miserable state of our planet and paints a plaintive picture of the disastrous effects of the human civilization on the natural environments .The phrase "once upon an earth" has a fairy tale like effect that evokes an, unspoiled image of nature prior to human intervention. But later she uses the phrases such as "**Alas for the forest", "Alas for the river**" etc that heighten the sense of contrast and create a sense of despondence that describe the earth now due to excessive exploitation by humans. "**Once upon an earth/There was a forest/Verdant, virgin, vibrant"** (1-3) presents a complete contrast to the following lines***: Alas for the forest Which now lies silent Stunned and stumped With the evidence Of her rape.*** *(21-25)* .Her use of the epithet "two-legged animal" refers to humans, a race which despite priding itself to be at the top of the hierarchies of all life forms has stooped so low in its manners and actions that destroyed the paradise of nature. The poet wishes to distance herself from an insensitive and selfish breed that has come to signify humanity and feels ashamed to belong to it. It is also symbolic of the extreme depravity and cupidity that has today come to define the human nature.She writes: **Alas for the river It is muddy now With the leaving Of the two-legged animal Who bleached her banks And bombed her depths** (45-50)

CONCLUSION

The Ecocritical analysis of the Indian literary texts reveal a consciousness informed by a deep love and concern for theindigenous cultures, traditions and fragile environments. We can explore a voice in their writings that employs the power of literature to raise environmental awareness amongst the people of India and urges them to apprehend and check the demonic forces of urbanization that severely threaten our existence on this planet. Thus ,literature serves as an urgent reminder to the indigenous people of their great cultural heritage comprising sustainable customs and traditions.The role of these writers play as custodians and advocates nature-friendly ways of life gain great relevance especially in times when indigenous cultures are endangered and fast losing their moorings to an onslaught of the urban consumer-culture. Besides, these literatures represent the much needed environmental ethics that by lending a voice to the silence of nature can counter the ethics of exploitation, abuse of nature and the unfortunate characteristics of the modern consumer-centric world. The inclusion of more ecological texts in the syllabus of schools and colleges has become significant to make the young generation realise that the world is now under a great threat of environmental degradation. If youths learn to value nature, they would better know how to protect the pristine beauty of nature. They must be made aware through literature of the new challenges that our mother earth is facing today .But if we cannot build an earth centered approach from the very beginning, it would cast havoc for mankind. Too much dependence on technology would produce dreadful results for our children as well as for us. We need books describing nature; the vast blue sky ,to enlarge our creative vision and imaginative spirit. The message of this study is nature is the real treasure and we must preserve nature and her pristine beauty with a resolution not to destroy what we cannot create.

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THE *THERIGATHA* AND THE FEMINIST IMAGINATION: DECOLONIZING GENDERED VOICES IN EARLY INDIAN LITERATURE

DR. HARINI PATOWARY DAS

ABSTRACT

The Therigatha which is a collection of verses composed by Buddhist nuns (Therīs) written over 2,500 years ago is one of the earliest feminist texts in Indian literary tradition. The verses which stand as a testament to women's self-realization, renunciation, and intellectual consciousness, challenges patriarchal structures and reclaims spiritual autonomy within an indigenous knowledge framework. Yet, its significance has been overlooked in feminist literary discourse. This paper examines the Therigatha through a decolonial feminist lens, placing it as a feminist text that articulates resistance, liberation, and the reimagining of gendered identities in early India. By situating it within contemporary feminist discourse, decolonial literary studies, and Indigenous Knowledge Systems (IKS), the paper examines its relevance in shaping modern conversations on gender, spirituality, and resistance that contests western feminist narratives. In reviving and reinterpreting this ancient text, the paper argues for establishing its continued significance in contemporary discourse,

Assistant Professor, Department of English,Lakhimpur Commerce College

emphasizing its role in decolonizing knowledge systems and expanding feminist literary traditions beyond Western paradigms.

KEY WORDS: Therigatha, Gender, Spiritual autonomy, Decolonial Feminism, Indigenous Knowledge System

INTRODUCTION

The *theris* were the senior among the Buddhist nuns, and they were addressed thus because of their religious achievements. The ordainment of the first twenty nuns was led by Buddha's stepmother, Mahapajapati Gotami who insisted on walking on the path of spiritual attainment so that Buddha had to acknowledge that men and women had the same ability to reach the state of Arhat or enlightenment. During that time, the society was structured around a rigid caste system and women faced several constraints. Behind the desire to be nuns in spite of the strict conditions of ordination and precepts to follow were several stories like widowhood, being childless, deaths of children, escape from domestic violence, renouncement from the lives of courtesan ship to seek spiritual liberation etc. The Therigatha or the "Verses of the Elder Nuns" which is a part of the Khuddaka Niyaka in the Sutta Pitaka of the Pali canon is a collection of poems composed by Buddhist women over 2,000 years ago documents these expressions of a radical female autonomy, self-awareness, and resistance against societal constraints. They tell the noteworthy stories of women who had struggled to survive in a society that afforded them no respect, but were able to practice Buddhism and take the spiritual journey towards enlightenment. These poems, a treasure of ancient Indian wisdom can be positioned as an earliest feminist text which passed on orally until 800 B.C.E., in the Magadhi language and then written down in Pali. Out of the 494 verses that it consists of, only 73 have identifiable speakers. As Hallisey has pointed out in the Introduction of his translated book, the identification of the authors of particular poems in the Therigatha was done in the intellectual context of the biographical traditions that were developed in various Buddhist communities in the century before the "Common Era" and it is still in its rudimentary stage (Hallisey, XV) .The poems in *Therigatha* are arranged on the number of verse in each chapter, the first chapter with poems of one verse and the last chapter with just one poem of seventy five verses.

The Therigatha can be analysed as a powerful Indian feminist text, expressing women's resistance to patriarchal structures and self-liberation much before the emergence of Western feminist discourse and therefore challenging the Eurocentric narrative that frames feminism as a predominantly modern and Western construct. By analyzing select verses through the lens of feminist theory, this paper aims to establish the Therigatha as a foundational feminist text while also questioning western feminist concepts that have historically overlooked non-European intellectual traditions.

OBJECTIVES OF THE PAPER

The present study is based on the following objectives:

- To establish the Therigatha as the earliest feminist text that voices women's self-liberation, and resistance against patriarchal norms.
- To compare select verses with Western feminist theories, highlighting similarities and divergences.
- To analyze the *Therigatha* as an epistemological text that embodies Indian spiritual philosophy through the examination of select verses.

METHODOLOGY

This paper employs a comparative literary and feminist analytical approach. Primary source includes the English translations of the verses of Therigatha by Charles Hallisey in his book, *Poems of the First Buddhist Women(2015)*. These verses are examined in relation to key Western feminist theories, like Simone de Beauvoir's concept of the "Other" (Beauvoir, 1949) and bell hooks's intersectional feminism (hooks, 1984). The research also integrates postcolonial feminist perspectives, particularly those of Chandra Talpade Mohanty (Mohanty, 1988), to argue for the decolonization of feminist thought by reinstating indigenous female voices. Secondary resources from books, journals and online sources are used for the study.

ANALYSIS OF SELECTED VERSES AND THEIR FEMINIST IMPLICATIONS

The first verse in chapter I in the Therigatha is spoken by the Buddha and is addressed to Therika or the senior Buddhist Nun.

"Now that you live among Therīs, Therikā, the name you were given as a child finally becomes you." (Hallisey,3)

These lines can be critically analysed within a feminist framework as a powerful moment of self-actualization and reclamation of identity. In patriarchal societies, women are often defined by familial, social, or religious roles and their names signify ownership, lineage, or societal expectations rather than individual identity. This verse suggests that while the name was given in childhood and which was perhaps passively accepted then, is now accepted fully and claimed by her in adulthood and in self-awareness. This aligns with feminist theories of self-definition developed by Judith Butler, bell hooks and Simone De Beavoir, where women must move beyond externally imposed identities and actively create their own identity to stand beyond the " other". Simone de Beauvoir' in her essay The Second Sex, argues that women must transcend passive roles and actively construct their own subjectivity which is also found in the nuns' quest for identity. The women who followed the paths of the Buddha and their decision to live among Therīs had renounced the worldly ties in pursuit of wisdom which opposes the patriarchal expectations of her roles as daughters, wives, or mothers. This act of self-reclamation resonates with modern feminist struggles where women assert control over their own lives, bodies, and identities, rejecting traditional roles assigned by family or society. The transition from individual identity (Therikā) to a shared community of Therīs reinforces the importance of collective feminist consciousness. Feminist scholars like Chandra Talpade Mohanty emphasize how women's collective action—especially among historically marginalized groups—creates stronger movements against oppression.

Another verse in chapter I by Sumangalamata named as Mutta in Charles Hallisey's translation speaks thus,

"The name I am called by means freed
and I am quite free, well-free from three crooked things,
mortar, pestle, and husband with his own crooked thing
I am freed from birth and death, what leads to rebirth has been rooted out."(Hallisey, 6)

establishes the speaker's ownership of her identity where her name is freed from social roles of a daughter, wife or mother. Mutta subverts this by claiming a name that signifies liberation rather than subjugation. This act of seeking freedom from imposed names to self-naming is significant as it reflects how these women sought to move beyond imposed identities to construct their own narratives . The phrase "well-free from three crooked things: mortar, pestle, and husband with his own crooked thing" is a bold critique of women's domestic and sexual servitude. While the mortar and pestle symbolize household labor, the "husband with his own crooked thing" (a euphemism for the phallus) directly critiques sexual control and patriarchal marriage. Mutta equates sexual subjugation with other forms of domestic oppression, rejecting them all in one breath. Radical feminist critiques like Kate Millett in her text, Sexual Politics argued about marriage being an institution of male dominance over women's labor, bodies, and reproductive autonomy. Mutta's liberation is however not just social, but also existential as she has freed herself from the cycle of birth and death (samsara). Simone de Beauvoir, in The Second Sex (Beauvoir, 1949), also critiques the social conditioning that confines women to reproductive and domestic labor, a condition Mutta explicitly rejects. However, unlike Beauvoir's existentialist approach, which sees female liberation as an intellectual realization, the Therigatha presents renunciation and spiritual enlightenment as a path to true autonomy. In Buddhist philosophy, the process of ordination is done in two phases – Pabbajja and Upasampada. Pabbajjā or renunciation leads to the discovery of one's true self, free from worldly illusions. The verse by Mutta implies that she has fully embodied her true calling by transcending her passive roles and actively constructing her subjectivity which also finds expression in western existentialist feminism.

In chapter 3 with three verses, Mara speaks thus to Soma,

It is hard to get to the place that sages want to reach,
It's not possible for a woman,
Especially not one with only two fingers' worth of wisdom.
To this Soma replies,
What does being a woman have to do with it?
What counts is that the heart is settled
and that one sees what really is"

The question *"What does being a woman have to do with it?"* serves as a rhetorical challenge to societal norms that often assign spiritual and intellectual capacities based on gender and by dismissing it, the verse asserts that the potential for spiritual insight is universal, available to anyone whose mind is resolute and clear. The "settled heart" emphasizes the importance of inner tranquillity, mindfulness, and self-mastery in the journey towards enlightenment. The emphasis on direct perception and insight into the nature of reality reflects the Buddhist emphasis on wisdom (prajñā) as the ultimate goal of the spiritual path. The verse indirectly critiques the social systems that devalue or limit the roles of women not only in the ancient society but seen in different society in every age.

Subha's Verses in the Therigatha challenges the objectification of women as she says,
"You really out of mind
What is it you see
When you look at this body
Filled as it with things that have already died,
Destined as it is to fall apart only to fill a cemetery" (Hallisey 87-88)

Here the speaker deconstructs the notion of physical beauty of the female body which is admired and this rejection of the male gaze precedes Western feminist critiques of objectification by thinkers like Laura Mulvey, who theorized the "male gaze" in cinema (Mulvey, 1975).The difference however lies in the fact that while Western feminism often seeks to reclaim the body from objectification, the Therigatha focuses on transcending bodily identity altogether and attaining spirituality.

Another nun Patachara, is the most poignant figures in the *Therigatha*, as her verses recount a profound personal tragedy—the loss of her entire family—which plunges her into deep sorrow. Her transcendental journey from a state of despair to one of spiritual insight is emblematic of Buddhist teachings and illustrates that even the deepest suffering can become the catalyst for profound spiritual awakening. As the Theris as many as five hundred nuns who follow her in quest of the spiritual attainment renouncing worldly grieves, speak about them being her as an inspiration,

" She expelled the grief of a son,
The grief that overwhelmed me…
…I go to the sage for refuge" (**Hallisey, 33-34**)

Patacara's journey from immense personal loss to spiritual awakening parallels bell hooks's concept of solidarity among women as a means of resistance (hooks, 1984). While Western feminist movements emphasize political activism, the Therigatha illustrates a different model of female resistance: renunciation, spiritual empowerment, and community building among women. C.T. Mohanty, in *Under Western Eyes: Feminist Scholarship and Colonial Discourses (Mohanty, 1988)*, critiques the universalizing tendencies of Western feminism, which often ignores the specificities of non-Western women's experiences. Mohanty argues that Third World women are frequently portrayed as passive victims rather than as active agents of resistance. The *Therigatha* challenges this narrative by presenting Buddhist nuns as autonomous individuals who reject societal expectations and assert their own individualities. The text stands as a counterpoint to this colonial tendency, demonstrating that indigenous feminist thought has long existed outside Western epistemologies. The *Therigatha* does not conform to the Western feminist model of activism; rather, it presents a radical vision of female liberation rooted in spiritual transcendence, which challenges the much Western feminist thought. The perspective of an alternative framework of spiritual liberation enriches global feminist discourse by incorporating non-Western epistemologies and advocating for a more inclusive understanding of feminism.

CONCLUSION

The Therigatha stands as one of the earliest feminist texts, articulating themes of agency, resistance, and sisterhood that remain relevant today. By comparing its verses with Western feminist theories, we recognize its contributions to global feminist thought while also critiquing the Eurocentrism of dominant feminist narratives. Integrating the insights of decolonizing feminist traditions as propounded by Mohanty this study seeks to highlight that the *Therigatha* resists the homogenization of feminist discourse and emphasize on the importance of recognizing diverse feminist traditions. The voices of the therīs serve as a testament to the enduring struggle for women's liberation, offering both historical precedent and contemporary relevance in the fight for gender justice.

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মহাপুৰুষ শ্ৰীমন্ত শংকৰদেৱৰ সৃষ্টি কৰ্ম আৰু বিশ্বজনীনতা

মৃদুস্মিতা হাজৰিকা
তিলক চন্দ্ৰ ডেকা

সংক্ষিপ্তসাৰ

অসমীয়া জাতীয় জীৱনক সকলো ফালৰপৰা সমৃদ্ধ কৰি যোৱা মহাপুৰুষ শ্ৰীমন্ত শংকৰদেৱৰ সৃষ্টিৰাজিয়ে যুগে যুগে সমাজ আৰু সাহিত্যত বিশেষ স্থান অধিকাৰ কৰি আছে। এক শৰণ নাম ধৰ্ম প্ৰতিষ্ঠা কৰি তেখেতে মানুহৰ হৃদয়ত এজন ঈশ্বৰৰ অস্তিত্ব প্ৰতিষ্ঠা কৰি অন্যায় -অসূয়াৰ পৰা সমাজ খন ৰক্ষা কৰি এখন সুন্দৰ সমাজ গঢ়ি তুলিবলৈ যত্ন কৰিছিল। মহাপুৰুষ শংকৰদেৱ আৰু মাধৱদেৱ অসাধাৰণ গুণৰ অধিকাৰী আছিল সেইবাবে দুয়োজনা গুৰুকে মহাপুৰুষ আখ্যা দিয়া হৈছে।

দুয়োজনা গুৰুৱে ধৰ্মীয় ভাৱধাৰাৰ সাহিত্য ৰচনা কৰি জনমানসত নিজৰ প্ৰতিভাৰ অতুলনীয় পৰিচয় ৰাখি থৈ গ'ল। মধ্যযুগীয় সাহিত্যিক সকলৰ ভিতৰত শংকৰদেৱেই অধিক বৰঙণি আগবঢ়াইছিল।

শংকৰদেৱৰ ৰচনাৰাজিক প্ৰধানকৈ ছটা ভাগত ভগাব পাৰি

কাব্য, ভক্তিতত্ত্ব প্ৰকাশক গ্ৰন্থ, অনুবাদমূলক গ্ৰন্থ, নাট, গীত, নাম প্ৰসংগ পুথি। তেখেতৰ ৰচনাৰাজিত জাতি- ধৰ্ম -বৰ্ণ নিৰ্বিশেষে বিশ্বজনীন ভাৱ ধাৰাৰ পৰিচয় পোৱা যায়। ধৰ্মৰ গভীৰ তত্ত্ব জনমানসৰ মাজত প্ৰচাৰিত কৰি সমাজত আধ্যাত্মিক ভাৱৰ এখন সুন্দৰ সমাজ গঢ়ি তুলিবলৈ চেষ্টা কৰি সফলতা লাভ কৰিছিল।

তেখেতৰ প্ৰত্যেক বিধ ৰচনাতে যদিওবা ধৰ্মীয় ভাৱ বা মতামত আছে তথাপি সেই ৰচনা সমূহত এনে কিছু দিশ আছে যিবোৰ বিশ্বজনীন। সকলো ধৰ্মৰ লোকৰ জীৱনত সেই ভাৱ বা দিশসমূহ প্ৰযোজ্য।

অধ্যাপক, অসমীয়া বিভাগ, লক্ষীমপুৰ বাণিজ্য মহাবিদ্যালয়
মূৰব্বী,অধ্যাপক, অসমীয়া বিভাগ, লক্ষীমপুৰ বাণিজ্য মহাবিদ্যালয়

আমাৰ গৱেষণা পত্ৰ খনত বিশ্লেষণাত্মক পদ্ধতিৰে শংকৰদেৱৰ সৃষ্টি ৰাজিত বিশ্বজনীনতা সম্পৰ্কে আলোচনা কৰা হ'ব।

বীজ শব্দ- সমৃদ্ধ, এক শৰণ , নাট, গীত, কাব্য, সাহিত্যিক।

অৱতৰণিকা

মহাপুৰুষ শ্ৰী মন্ত শংকৰদেৱে অসমীয়া জাতি - জনগোষ্ঠীক একতাৰ দোলেৰে বান্ধিবলৈ যি প্ৰচেষ্টা আগবঢ়াইছিল সেয়া আদৰণীয়। মহাপুৰুষ জনাই গীত, নাট, বাদ্যৰে অসমীয়া জাতিৰ সম্প্ৰীতিৰ এনাজৰী ডাল বান্ধি থৈ গ'ল। অতুলনীয় প্ৰতিভাৰে নিজৰ সাহিত্য ৰাজি বিশ্ব দৰবাৰত প্ৰতিষ্ঠা কৰিবলৈ মহাপুৰুষ জনা সক্ষম হৈছিল। শংকৰদেৱৰ অৱদান অসমীয়া সমাজলৈ ইমানেই বিস্তৃত যে অসমীয়া সমাজ খনক এক নৱ ৰূপ দিবলৈ সক্ষম হৈছে। প্ৰতিজন অসমীয়া লোকৰ বাবে গৌৰৱৰ কথা যে অসমক বিশ্ব সাহিত্যৰ বুকুত নাম খোদিত

কৰিব পৰাকৈ আগুৱাই লৈ গৈছে। সাঁচিপাতত তেখেতে সাহিত্য ৰচনা কৰি বিশ্ব সাহিত্যৰ লগত ফেৰ মাৰিবলৈ সক্ষম হ'ল। তেখেতৰ বৃন্দাৱনী বস্ত্ৰ ইংৰাজে লৈ যোৱাৰ পিছতো নিজৰ পৰিচয় অটুট আছে।

উদ্দেশ্যসমূহ

মহাপুৰুষ শ্ৰীমন্ত শংকৰদেৱ আছিল সৰ্বগুনসম্পন্ন এজন মহান ব্যক্তি। বিশ্বশিল্পী জনাৰ সৃষ্টিকৰ্ম অধ্যয়নৰ প্ৰাসংগিকতা আহি পৰিছে। বৰ্তমান সময়ত শংকৰদেৱৰ যি আদৰ্শ সেয়া অতি গুৰুত্বপূৰ্ণ হৈ পৰিছে। তেখেতে জাতি-বৰ্ণ-ধৰ্ম নিৰিশেযে সকলোকে একতাৰ ডোলেৰে বান্ধি ৰাখিছিল। আলোচনা পত্ৰ খনিৰ উদ্দেশ্য আৰু গুৰুত্ব সেই খিনিতেই নিহিত হৈ আছে।

অধ্যয়নৰ পদ্ধতি

এই গৱেষণা পত্ৰ খন মূলতে দ্বিতীয়ক তথ্যৰ ওপৰত আধাৰিত।এই তথ্যবোৰ বিভিন্ন উৎসৰ পৰা সংগ্ৰহ কৰা হৈছে। উৎসবোৰ হৈছে কিতাপ, আলোচনী, বাতৰিকাকত, প্ৰবন্ধ আৰু ইণ্টাৰনেট। প্ৰাথমিক পৰ্যবেক্ষণ আৰু উপলব্ধি ওপৰতো কিছুমান দিশৰ ওপৰত বিশ্লেষণ কৰিবলৈ প্ৰয়াস কৰা হৈছে।

বিষয় আলোচনা

মহাপুৰুষ শংকৰদেৱ আছিল দেশ আৰু জাতিক সকলো ফালৰ পৰা সমৃদ্ধ কৰা এজন ব্যক্তি। ভাৰতৰ বিভিন্ন ঠাই ঘূৰি তেখেতে সমল সংগ্ৰহ কৰিছিল। আহোম যুগতে অসমীয়া জাতীয় জীৱনত তেখেতৰ সুকুমাৰ কলাৰ আধাৰিত নৱ বৈষ্ণৱ ধৰ্মৰ গণমুখী জোৱাৰ উঠিছিল। এক শৰণ নাম ধৰ্মৰ জৰিয়তে তেখেতে সমাজৰ সকলো সম্পদায়ৰ লোককে একতাৰে বান্ধি ৰাখিবলৈ যত্ন কৰিছিল। ড০ পোনা মহন্ত দেৱে কৈছিল 'মধ্যযুগীয় সন্ত কবিসকলৰ ভিতৰত শংকৰদেৱৰ জীৱন আৰু কৃৰ্তি বিচিত্ৰ। একে সময়তে কবি, নাট্যকাৰ, অভিনেতা, পৰিচালক,নৃত্য বিশাৰদ,সংগীতজ্ঞ চিত্ৰশিল্পী, ধৰ্মগুৰু ,সংস্কৃতি সাধক, সমাজ গঢ়োতাৰ ভূমিকাত অৱতীৰ্ণ হোৱা

শংকৰদেৱ প্ৰকৃতাৰ্থত এক বিৰল ব্যক্তিত্ব। কিন্তু আমি এই কথা নিজৰ ভিতৰতে কৈ থাকি সন্তুষ্টি লভিলে নহ'ব। ইংৰাজী, হিন্দী আদি ভাষাৰ মাধ্যমেদি মহাপুৰুষ জনাক জগত সভালৈ কঢ়িয়াই নিলেহে বিশ্বই তেওঁক চিনি পাব। " উচ্চ-নীচ, জাত-পাতৰ বিভেদ নাইকীয়া কৰাৰ বাবে তেখেতে নাম-কীৰ্তন আৰু প্ৰসাদ বিতৰণ কৰি সকলোকে আদৰি ল'লে। সন্মান সহকাৰে সকলোৱে সমাজ ত জীয়াই থাকিব পৰা হ'ল।

গুৰুজনাৰ সৃষ্টি কৰ্মৰ দ্বাৰা সকলো শ্ৰেণীৰ লোক উপকৃত হ'ব পাৰে।

১। বৰগীত -বৰগীত সমূহ নিৰ্দিষ্ট ৰাগত আৰু তালত পৰিবেশন কৰা হয় বৰ্তমান বৰগীত সমূহ শিকি বিভিন্ন জন শিল্পীয়ে পৰিবেশন কৰে গায়ক অকল নৱবৈষ্ণৱ ধৰ্মী হ'ব লাগিব বুলি কথা নাই। জাতি-বৰ্ণ-ধৰ্ম নিৰিশেষে সকলোৱে এই গীত সমূহ শিকি দেশে- বিদেশে গাব পাৰে । বৰগীত সমূহ ভাৰতীয় শাস্ত্ৰীয় সংগীতৰ অসমৰ স্বকীয় ধাৰা।বৰগীত সমূহ প্ৰশিক্ষণ প্ৰাপ্ত লোকৰ জৰিয়তে সমগ্ৰ বিশ্বতে প্ৰচাৰ আৰু প্ৰসাৰ কৰিবলৈ পদক্ষেপ ল'ব লাগিব।

২। ভাওনাৰ লগত জড়িত বাদ্যযন্ত্ৰ খোল, তাল, মৃদং ইত্যাদিও নিৰ্মাণ কৰিব লাগে। সেই সমূহ শিল্পীৰো কোনো জাতি -ধৰ্ম-বৰ্ণৰ বাধ্যবাধকতা নাই সকলোৱে এই কাম কৰিব পাৰে। খোল,তাল ইত্যাদি অসমীয়া জনগোষ্ঠী তথা অনা অসমীয়া, অনা বৈষ্ণৱ সকলেও এই বাদ্যযন্ত্ৰ তৈয়াৰ কৰি আহিছে। শংকৰদেৱৰ সৃষ্ট ভাওনাক শৈক্ষিক ভাৱে আগবঢ়াই নিবলৈ যত্ন কৰিব পাৰি। উপযুক্ত প্ৰশিক্ষণ দি ভাৰত তথা সমগ্ৰ বিশ্বত ইয়াৰ প্ৰচাৰৰ ব্যৱস্থা গ্ৰহণ কৰা উচিত।

৩। ভাওনাৰ লগত ব্যৱহৃত হোৱা সাজ-পাৰ, মূখা, ৰূপসজ্জাৰ লগত জড়িত শিল্পী সকলো ভিন্ন ধৰ্ম বৰ্ণৰ লোক। তেওঁলোক প্ৰত্যক্ষ ভাৱে, ধৰ্মীয় ভাৱে জড়িত নহ'লেও ভাওনাৰ লগত ওতঃপ্ৰোতভাৱে জড়িত। অসমীয়া লোকে এটা সময়ত ভাওনাৰ সাজ-পাৰ সকলো অসমতে প্ৰস্তুত কৰিছিল। ঠায়ে ঠায়ে ভাওনা প্ৰদৰ্শন হোৱা ঠাইডোখৰত কুটীৰ শিল্প গঢ়ি উঠিছিল। কিন্তু বৰ্তমান ভাওনাত কলকাতাৰ পৰা অহা পোছাক পৰিধান কৰা দেখা যায়। গতিকে অসমৰ কুটীৰ শিল্পত আঘাত হানিলেও ভাৰতৰ অন্য জাতি -বৰ্ণৰ লোকো ইয়াৰ দ্বাৰা লাভান্বিত হোৱা দেখা গৈছে।

৪। ঠিক তেনেকৈ বৰ্তমান যুগত ব্যৱহৃত ভাওনাৰ পোহৰ, শব্দ যন্ত্ৰ ইত্যাদিৰ ব্যৱস্থাটো বিভিন্ন জন লোক অৰ্থনৈতিক ভাৱে জড়িত। তেখেত সকলৰ ধৰ্মীয় বাধ্যবাধকতা নাই। ভাওনা মঞ্চত পৰিবেশন কৰা ভাওনা প্ৰতিযোগিতা অনুষ্ঠিত কৰাত আজিকালি উচ্চ প্ৰযুক্তি সম্পন্ন যন্ত্ৰ -পাতি ব্যৱহাৰ কৰাত যি সকল পাৰ্গত ব্যক্তি তেওঁলোকে কৰিবলৈ লোৱাত দৰ্শক সকলো মোহিত হৈছে। পৰিৱৰ্তন সকলোতে আহে। আমাৰ সাতামপুৰুষীয়া ভাওনা স্বকীয়তা ৰক্ষা কৰি সমগ্ৰ বিশ্বত প্ৰচাৰ আৰু প্ৰসাৰ কৰিবলৈ পদক্ষেপ গ্ৰহণ কৰিব লাগে।

৫। মাজুলীৰ মুখাশিল্পই ইতিমধ্যে সমগ্ৰ বিশ্বতে সমাদৰ লাভ কৰিছে। দেশী-বিদেশী পৰ্যটক সকলেও মাজুলীৰ মুখাশিল্প পৰিদৰ্শন কৰি কিছু সংখ্যকে প্ৰশিক্ষণো গ্ৰহণ কৰিছে।মুখা নিমাৰ্ণৰ বাবে আৰু অধিক লোক নিয়োগ কৰিব লাগে। আৰু ইয়াৰ প্ৰসাৰ কৰিব লাগে।

৬। শংকৰদেৱৰ দ্বাৰা সৃষ্ট সত্ৰীয়া নৃত্য সমূহে ভাৰতীয় শাস্ত্ৰীয় নৃত্যত স্থান পালেই নহ'ব, সত্ৰীয়া নৃত্য সমূহ বিশ্ব দৰবাৰলৈ লৈ যাবলৈ চৰকাৰৰ লগতে বিগ্ৰ সকলে এই ক্ষেত্ৰত পদক্ষেপ ল'ব লাগিব।

এনেকৈ আলোচনা কৰিলে দেখা যায় যে, গুৰুজনাৰ ৰীতি-নীতি, আচাৰ-ব্যৱহাৰ, সাজ-পাৰ ইত্যাদি ও সাৰ্বজনীন।

গতিকে শংকৰদেৱৰ সৃষ্টিৰাজিত বিশ্বজনীনতা সৰ্বত বিদ্যমান। আমি শংকৰদেৱৰ সৃষ্টি ৰাজি বিশ্ব দৰবাৰত প্ৰতিষ্ঠা কৰিবলৈ যত্ন কৰিব লাগে।

উপসংহাৰ

অসমীয়া সমাজ খন সকলো দিশত আগুৱাই লৈ গৈ তেখেতে জাতিটোক বিশ্বত পৰিচয় ৰাখি যাবলৈ সুযোগ দিলে। সমগ্ৰ পৃথিৱীতে হয়তো শংকৰদেৱৰ দৰে সকলো গুণ সম্পন্ন ব্যক্তিৰ জন্ম হোৱা নাই। আধুনিক যুগত বহুলোকৰ অকাল মৃত্যু হোৱা দেখা গৈছে। সেই বাবে বহু লোক স্বাস্থ্য সম্পৰ্কেও সচেতন হোৱা দেখা গৈছে। মহাপুৰুষ জনাই পাচশ বছৰৰ আগতেই নাম প্ৰসংগৰ যোগেদি নানা ধৰণৰ প্ৰাণায়ম সৃষ্টি কৰি গৈছে। যিসকলে এই নিয়ম মানিছে তেখেত সকল দীৰ্ঘ জীৱী হোৱা দেখা গৈছে। গুৰুজনাৰ ধৰ্ম মত আৰু দৰ্শনে সমাজ খনক এক নেতৃত্ব প্ৰদান কৰি গ'ল যি কেৱল অসমতে সীমাবদ্ধ নাথাকি সুদূৰপ্ৰসাৰী হ'ল। সত্ৰ আৰু নামঘৰৰ সৃষ্টি কৰি তেখেতে সকলোকে একতাৰ দোলেৰে বান্ধি ৰাখিলে।

শেষত আমি এই সিদ্ধান্তলৈ আহিব পাৰো যে শংকৰদেৱৰ সৃষ্ট ধৰ্ম দৰ্শন কলা সংস্কৃতি সকলো দিশতেই সাৰ্বজনীনতা বিশ্বজনীনতা প্ৰকাশ পাইছে ।

গ্ৰন্থপঞ্জী ঃ

১। বৰা, দয়াল কৃষ্ণ। শ্ৰীমন্ত শংকৰদেৱ আৰু ভাৰতীয় জাতীয়তাবাদ। অখিল ভাৰতীয় বিদ্যাৰ্থী পৰিষদ, ১৯৯৫।

২। মহন্ত, পোনা। নাটক আৰু নাট্য কাৰ, বনলতা, ডিব্ৰুগড়, প্ৰথম সংস্কৰণ, ১৯৮৬

৩। নেওগ, মহেশ্বৰ। মহেশ্বৰ নেওগ ৰচনাৱলী, বাণী মন্দিৰ,১৯৮৬
মজুমদাৰ বিমল, ভক্তি সাহিত্য, চন্দ্ৰ প্ৰকাশ, ১৯৯৯।

৪। মহন্ত ,পোনা, শংকৰদেৱ অধ্যয়ন: কিঞ্চিৎ চিন্তা, গৰীয়সী,ফেব্ৰুৱাৰী, ২০২২

৫। বৰুৱা, প্ৰহ্লাদ কুমাৰ ঃ ধৰ্ম সাহিত্য সংস্কৃতি, কৌস্তুভ প্ৰকাশন, প্ৰথম প্ৰকাশ, ২০০৩

Village Tourism: Opportunities in Assam

Dr. Rinti Dutta

ABSTRACT

As we know that India is one of the best tourist hubs in the world. There have different types of tourism in our country. But the village tourism is entirely different from other types of tourism. Because it focuses on responsible tourism towards society as well as contributes to the rural development.in the recent scenario, village tourism is gaining importance day by day.Village tourism has emerged as a viable means of sustainable development and cultural preservation. Village tourism is an emerging trend in sustainable travel that allows visitors to experience rural life, culture, and traditions. Assam, with its rich biodiversity, ethnic diversity, traditional lifestyles, and scenic beauty, holds vast untapped potential for village tourism. This paper explores the potential of village tourism in Assam as a driver for economic growth, cultural preservation, and rural empowerment. The study also identifies the challenges, analyzes current initiatives, and provides recommendations for sustainable village tourism in the region.

Keywords: Village Tourism, Assam, Rural Development, Cultural Heritage, Sustainable Tourism

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Assistant Professor, Lakhimpur Commerce College

Assistant Professor
Lakhimpur Commerce College

1. INTRODUCTION

Tourism is a key driver of economic growth, particularly in rural areas. In Assam, where a large portion of the population lives in villages, village tourism can create livelihood opportunities, reduce migration, and preserve cultural heritage. This paper examines the scope, benefits, and future potential of village tourism in Assam.

Village tourism, also known as rural tourism, is an emerging form of sustainable travel that focuses on exploring the cultural, agricultural, and traditional lifestyle of rural communities. It offers travelers a unique opportunity to experience life in the countryside, often through homestays, local crafts, folk performances, and participation in farming or daily rural activities. In contrast to mainstream tourism, village tourism emphasizes authenticity, community involvement, and environmental preservation.

Tourism is an essential sector contributing to economic development, especially in rural regions where traditional livelihoods are dwindling. Village tourism offers travelers authentic experiences while supporting rural communities. Assam, with its diverse ethnic groups, natural beauty, and traditional practices, is uniquely positioned to benefit from village tourism. This research aims to examine the opportunities and challenges of village tourism in Assam.

In recent years, there has been a growing interest in village tourism due to increasing urbanization and a global desire to reconnect with nature and heritage. Many governments and non-governmental organizations have recognized its potential as a tool for rural development, poverty alleviation, and cultural preservation. For developing countries like India, where the majority of the population still resides in rural areas, village tourism presents a significant opportunity to boost the local economy while promoting sustainable and inclusive growth.

This paper explores the concept, opportunities, and challenges of village tourism, with a focus on its impact on rural livelihoods, socio-cultural transformation, and sustainable development. Through case studies and field analysis, it also aims to highlight best practices and strategies for promoting village tourism in a responsible and community-centric manner.

2. OBJECTIVES OF THE STUDY

1. To explore the scope of village tourism in Assam.
2. To assess the economic and social benefits of village tourism for rural communities.
3. To identify challenges and limitations in implementing village tourism.

3. LITERATURE REVIEW

Past studies have highlighted the importance of rural tourism in enhancing local economies and preserving cultural heritage (Patel &Chavan, 2019). According to the Ministry of Tourism (2020), village tourism can diversify the rural economy while reducing urban migration. In Assam, limited research has been conducted on the structured development of village tourism, which calls for a detailed analysis.

4. METHODOLOGY

This paper adopts a qualitative approach based on secondary data sources including government reports, scholarly articles, case studies, and tourism department publications. Data is analyzed thematically to draw insights into village tourism in Assam.

5. POTENTIAL OF VILLAGE TOURISM IN ASSAM

Village tourism involves tourists visiting rural areas to experience everyday life, agricultural practices, crafts, folklore, and local cuisine. It differs from mass tourism by being people-centric and environmentally sustainable. It is closely tied with ecotourism and cultural tourism.

5.1 RICH CULTURAL HERITAGE

Assam is home to multiple indigenous communities like the Bodos, Mishings, Karbis, and others, each with unique customs, dances (e.g., Bihu), and festivals. Rural areas are surrounded by tea gardens, forests, and rivers, which are ideal for experiential tourism. Festivals such as Bihu, Baikho, and Ali Ai Ligang offer tourists immersive cultural experiences. The Kaziranga National Park and Manas Biosphere Reserve are also in proximity to rural villages, attracting nature lovers and eco-tourists.Tourists can engage in cultural exchange by staying in homestays and participating in local traditions.

5.2 NATURAL BEAUTY

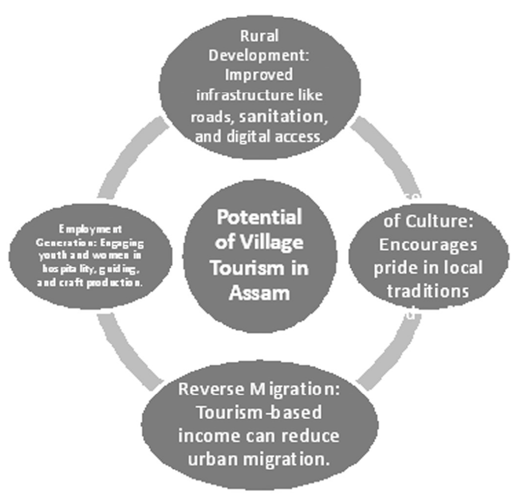
The Brahmaputra Valley, tea gardens, forests, and national parks (like Kaziranga and Manas) make Assam an attractive destination. Many scenic villages are located near these areas, providing a peaceful escape for travelers.

5.3 TRADITIONAL HANDICRAFTS AND AGRICULTURE

Villages in Assam are known for handloom products like Mekhela Chador, bamboo crafts, and organic farming. These elements offer experiential tourism opportunities and economic benefits through local product sales.

6. ECONOMIC AND SOCIAL BENEFITS

6.2 Socio-Economic Impact Village tourism creates employment, particularly for women and youth, in the hospitality and craft sectors. According to the Assam Tourism Development Corporation (2022), tourism-related activities in villages contributed to a 12% increase in household income in participating regions over five years. In Majuli alone, the number of homestays increased from 5 in 2015 to over 45 in 2022, providing direct income to more than 300 families. Indirect employment also increased in sectors like transportation and catering.



6.3 CASE STUDIES

Majuli Island:

Majuli, a river island located in the Brahmaputra River in Assam, India, is a culturally rich destination that offers a unique blend of **nature, spirituality, tribal culture,** and**eco-friendly tourism.**Majuli is known for its satras and mask-making traditions, Majuli has seen increased tourist footfall due to its cultural richness. The island hosted over one lakh domestic and international tourists in last several years.

Sualkuchi:

Sualkuchi is renowned for its centuries-old silk weaving tradition, especially Muga silk – unique to Assam. Known as the "Manchester of Assam," nearly every household in Sualkuchi is involved in the weaving industry. Sualkuchi "Silk Village of Assam," Sualkuchi attracts tourists interested in handloom weaving. It generates employment for weavers and artisans, many of whom now supplement their income through tourism-related sales and workshops.In recent years,Sualkuchi has emerged as a model for **village tourism,** attracting both domestic and international tourists interested in handicrafts, culture, and eco-tourism.

Kaziranga :

Kaziranga village tourism offers a rich blend of wildlife adventure and immersive cultural experiences. Nestled around the iconic Kaziranga National Park in Assam, these villages provide visitors with a unique opportunity to explore traditional lifestyles of communities. Tourists can stay in eco-friendly homestays, enjoy authentic Assamese cuisine, and witness vibrant performances such as the Bihu dance. Beyond cultural immersion, visitors can embark on jeep or elephant safaris, birdwatching trails, and tea estate tours, all set against the lush backdrop of Kaziranga's diverse landscape. This form of rural tourism not only enriches the traveler's experience but also supports local livelihoods and conservation efforts.

7. CHALLENGES IN PROMOTING VILLAGE TOURISM

i) Poor Infrastructure: Roads, electricity, and internet connectivity remain weak in many rural areas.

ii) Lack of Awareness and Training: Villagers often lack tourism management skills and hospitality training.

iii) Marketing and Branding: Assam's rural tourism potential is underrepresented in mainstream tourism marketing.

iv) Environmental Concerns: Risk of over-tourism and cultural dilution if not managed sustainably.

8. GOVERNMENT INITIATIVES AND POLICY FRAMEWORK

The Assam government and Ministry of Tourism, Government of India, have launched several initiatives such as: The SwadeshDarshan Scheme and the Rural Tourism Scheme support rural infrastructure development. The Government of Assam launched the 'AsomDarshan' initiative, which is for promoting lesser-known destinations, including rural villages. Despite these efforts, implementation remains inconsistent and often fails to reach remote villages due to bureaucratic delays and funding constraints.However, implementation and awareness need to be strengthened at the grassroots level.

9. RECOMMENDATIONS

1. Infrastructure Development: Improve connectivity and essential services in potential village tourism sites.
2. Capacity Building: Provide training in hospitality, language, and environmental management.
3. Digital Promotion: Create online platforms to market homestays and rural experiences.
4. Public-Private Partnerships: Encourage investments from private operators in collaboration with local communities.
5. Sustainability Practices: Adopt community-based tourism models that focus on preserving natural and cultural assets.

10. CONCLUSION

Village tourism holds immense potential for Assam. Village tourism in Assam offers a unique blend of nature, culture, and community experience. With strategic planning, capacity building, and sustainable practices, it can become a strong pillar of rural development and cultural preservation in Assam. The need of the hour is a collaborative approach involving government, communities, and entrepreneurs to unlock this potential responsibly. It can generate employment, preserve indigenous cultures, and promote inclusive growth. However, for it to succeed, a coordinated approach involving communities, government, and private stakeholders is essential. With the right support, Assam can become a leading destination for authentic and sustainable village tourism in India.

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