Siksha Samhita Journal PDUAMD (2025) Vol 1(1):1-6; **ISSN : 3107-6335**

S.S.J.
PDUAMD

Trend and Composition of India's Tea Exports: An Analysis Based on HS Code 0902 (2014-2024)

Dr. Arifa Tabassum
Assistant Professor
Department of Economics
S. B. Deorah College
Email: tab.arifa@gmail.com

Abstract :
Tea is one of the most important plantation crops in India and plays a significant role in the country's agricultural economy and international trade. India is among the leading producers and exporters of tea in the global market. The present study examines the trend and composition of India's tea exports to the world during the period 2014-2024. The analysis is based on the Harmonised System classification of commodities, particularly HS Code 0902-Tea, which categorises tea exports into different sub-categories. The study uses secondary data and applies simple descriptive tools such as tables, percentage analysis, growth rate calculations and graphical representation to analyse export performance. The findings indicate that India's tea exports have experienced moderate fluctuations over the study period, with a noticeable expansion in recent years. The analysis further reveals that the export structure is heavily dominated by HS Code 090240, which accounts for the largest share of total tea exports. Other categories, particularly green tea exports, contribute only a small portion of the export basket. The study highlights the continuing importance of black tea exports in India's tea trade and emphasises the role of tea as an important agricultural export commodity.

Keywords: Tea Export, HS Code Classification, Export Composition, Black Tea Export, India, International Trade.

Introduction :
Tea is one of the most widely consumed beverages globally and forms an important part of international agricultural trade, with developing countries accounting for a major share of global production and exports (Food and Agriculture Organization, 2022). In India, tea cultivation has developed into a major plantation industry that contributes significantly to employment, rural livelihoods and export earnings. India is among the largest producers and exporters of tea in the global market, and Indian tea is widely recognised for its unique flavour and quality. The tea industry therefore holds an important position in India's agricultural and trade sectors.

Tea cultivation in India is mainly concentrated in regions such as Assam, West Bengal, and Tamil Nadu, where favourable climatic conditions support large-scale production. These regions account for a significant share of the country's tea output and play a major role in supplying tea for both domestic consumption and export markets. The tea industry also provides employment to a large number of workers and contributes to the economic development of these regions. India remains one of the leading producers and exporters of tea globally, contributing a significant share to both production and international trade (International Tea Committee, 2022).

Tea exports are an important component of India's agricultural trade and contribute to the country's foreign exchange earnings. Indian tea is exported to several countries across the world, with major markets including Russia, United Arab Emirates, and United Kingdom. The international demand for Indian tea has helped the country maintain a strong position in the

global tea trade. According to the Tea Board of India, India continues to remain one of the leading exporters of tea in the world. Agricultural exports contribute significantly to economic growth by generating foreign exchange earnings and supporting rural employment in developing countries (World Bank, 2020).

In order to analyse international trade more systematically, commodities are classified according to the Harmonised System (HS) of product classification. Under this system, tea exports are recorded under HS Code 0902-Tea, which is further divided into four six-digit categories based on the type of tea and its packaging. These sub-categories include green tea and black tea exports in different packaging forms. Analysing these categories helps to understand the composition of tea exports and identify which types of tea contribute the most to export earnings.

Over the years, the performance of tea exports has been influenced by several factors such as changes in global demand, fluctuations in production, price variations and international trade conditions. Studying the trend and composition of tea exports therefore provides useful insights into the structure and performance of India's tea trade. An important factor behind the strong export performance of Indian tea is the contribution of major tea-producing regions such as Assam. Assam is the largest tea-producing region in India and accounts for a significant share of the country's total tea production. The region is particularly known for producing strong-flavoured black tea, which is widely used in blended teas in international markets. Because of its distinctive taste and quality, Assam tea has developed a strong reputation among global consumers. A large portion of India's exported black tea originates from tea estates in Assam, which helps explain the dominance of bulk black tea exports in India's export structure (Tea Board of India, 2024). The favourable climate, fertile soil and long history of tea cultivation in Assam have therefore played a crucial role in strengthening India's position in the global tea trade.

In this context, the present study attempts to analyse the trend and composition of India's tea exports to the world during the period 2014-2024. The study focuses on different six-digit categories of tea exports and examines their relative share and growth patterns. By analysing export trends, percentage distribution and growth rates, the study aims to provide a clearer understanding of the pattern and performance of India's tea exports in the international market.

Literature Review

Several studies have examined the performance and determinants of tea exports from India. For instance, a study by Das et al. found that tea exports have shown positive growth over time, although export values and unit prices often experience fluctuations due to changes in international prices and exchange rates. The study also identified major export destinations such as Russia, the United States, the United Kingdom and the United Arab Emirates, indicating the global importance of Indian tea in international trade. Furthermore, the research highlights that international market conditions and price competitiveness play an important role in determining the export performance of tea from India (Das et al., 2021).

Similarly, research on the competitiveness of Indian tea exports indicates that India has historically maintained a strong position in the global tea trade, exporting tea to several international markets including Europe, North America and Asia. However, the study also indicates that increasing competition from other tea-producing countries such as China, Kenya and Sri Lanka has affected India's export share in recent years (Kumar, 2018).

Other studies suggest that fluctuations in tea export earnings are common in agricultural commodities because export performance depends on factors such as production levels, international demand, and price variations. Changes in domestic consumption and export prices can also influence the quantity of tea available for export (Mathur & Vasisht, 1994).

India's tea exports are geographically diversified, with major destinations including Iraq, the United Arab Emirates, Russia, Iran, the United States and the United Kingdom, reflecting strong demand across West Asia and developed markets (ITC, 2022). These countries emerged as key markets due to their high consumption levels and preference for strong tea varieties (The Adivasis, 2024).

The literature reviewed above forms the basis of the present study, which aims to examine the export trends and category-wise performance of tea from India.

Objectives of the study

The main objectives of the present study are:

i. To analyse the trend of India's tea exports during the period 2014-2024.

ii. To examine the composition of tea exports based on six-digit HS classification.

iii. To study the percentage share of different tea export categories.

iv. To analyse the growth rate of tea exports across different categories.

Data Source and Methodology

The study is based entirely on secondary data. The export data used in the analysis are obtained from the UN Comtrade. Information about the tea industry and export trends has also been collected from the Tea Board of India and other available reports. The study covers the period 2014-2024 and focuses on export values measured in US dollars (million). Tea exports are analysed according to the Harmonised System classification under HS Code 0902, which is further divided into four six-digit categories HS Code 090210, HS Code 090220, HS Code 090230, HS Code 090240. The Harmonised System (HS) is an internationally standardised classification system used to facilitate global trade by ensuring uniform identification of traded goods across countries (World Customs Organization, 2019). These categories help in analysing the structure and composition of India's tea exports. The study adopts a descriptive analytical approach to examine the trend and composition of India's tea exports. Since the research is based on secondary data, simple statistical and graphical tools have been used to analyse the data.

Results and Analysis

Trend of India's Tea Exports (2014-2024)

The trend of India's tea exports during the period 2014-2024 was analysed using export values under HS Code 0902-Tea. The export values were measured in US dollars (million) and represented graphically using a bar diagram to observe the pattern of changes over time.

Figure 1: India's Export of Tea (HS Code 0902) to World (in US$ million)
Source: UN Comtrade

The analysis indicates that India's tea exports experienced moderate fluctuations during the study period. Figure 1 shows that in the year 2014 the export value stood at approximately US$ 656.21 million, which increased slightly to US$ 677.93 million in 2015. However, a small decline was observed in 2016 when exports fell to around US$ 661.72 million. Exports again rose to US$ 768.19 million in the year 2017 and this upward trend continued to the year 2018, with exports remaining relatively stable at US$ 766.11 million. The highest value during the study period was seen in the year 2019, reaching about US$ 813.75 million. This increase indicated a strong international demand for Indian tea. The relatively higher export value observed in 2019 may be associated with favourable global demand conditions and stable export markets for Indian tea. Studies on India's tea trade indicate that the country exports tea to a wide range of international markets, and strong demand from major importing countries can significantly boost export performance in particular years (Kumar, 2018). Moreover, export growth is often influenced by favourable price movements and exchange rate conditions, which can improve the competitiveness of Indian tea in international markets (Das et al., 2021). However, a noticeable decline was noticed in the year 2020, when export value was around US$ 692.07 million and this decline continued to the year 2021, with exports around US$ 687.89 million. These reductions may be linked to disruptions in the international trade and global market conditions during that period. The decline in tea exports during this period may be linked to disruptions in production and international trade. Agricultural export studies suggest that changes in climatic conditions, production instability and shifting global demand can significantly affect export performance in certain years. In addition, growing domestic consumption and increased competition from other tea-producing countries such as China, Kenya and Sri Lanka may reduce the share of exports in total production, thereby influencing export values in some years (Radhika et al., 2024). Following this decline, exports began to recover gradually and by the year 2023 and 2024 export values had increased to about US$ 706.90 million and US$ 804.16 million respectively. The overall trend analysis indicates that although India's tea exports experienced some fluctuations, however, the overall pattern reveals recovery and sustained export performance in the recent years.

Fluctuations in agricultural exports are common because export earnings depend on factors such as international demand, production levels and export prices. Studies on tea export performance indicate that variations in export values often arise due to changes in global tea prices, exchange rates and market demand in importing countries (Das et al., 2021). In addition, agricultural export earnings are generally unstable because production and supply depend heavily on climatic conditions and other external factors. As a result, changes in production levels and export prices

can significantly influence the quantity and value of tea exports (Mathur & Vasisht, 1994). Export instability is a common feature in agricultural commodities, as production and trade are influenced by external factors such as weather conditions, global demand and price volatility (United Nations Conference on Trade and Development, 2018).

Comparative Composition of Tea Exports

In order to understand the structure of India's tea exports a comparative analysis of the four categories (6-digit classification) under HS Code 0902 was conducted. These categories include HS Code 090210, HS Code 090220, HS Code 090230, HS Code 090240.

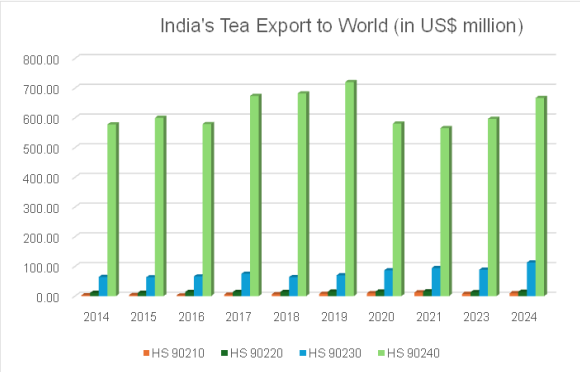


Figure 2: India's Tea export (HS Codes-090210, 090220, 090230 and 090240) to World (in US$ million)
Source: UN Comtrade

Figure 2 demonstrates the comparative bar diagram which clearly reveals that HS Code 090240 consistently dominates India's tea exports throughout the study period. Export values for this category were significantly higher than those for other categories. In the year 2014, exports under this category were about US$ 577.85 million and it increased to US$ 720.55 million in 2019, recording the highest value for this category during the study period. Although exports declined to US$ 565.53 million in 2021 but it recovered again and reached US$ 666.91 million in 2024. The dominance of HS Code 090240, representing black tea exported in packings greater than 3 kilograms, reflects the structural characteristics of India's tea export industry. India has historically specialised in the production and export of black tea, particularly the CTC (Crush-Tear-Curl) variety, which is widely used in international blending markets. As a result, bulk black tea exports account for a significant share of India's tea trade. Studies on the Indian tea industry indicate that black tea constitutes the overwhelming majority of the country's tea exports, accounting for more than 95 percent of total export volume, while green tea represents only a small proportion of shipments (India Brand Equity Foundation, 2024). In addition, many importing countries prefer bulk shipments of black tea because it allows local companies to blend, process and package tea according to consumer preferences in their domestic markets. Consequently, tea exported in larger packings is an important component of international tea trade and contributes significantly to export earnings for producing countries such as India (Verma, 2022). The predominance of bulk black tea exports is also closely related to India's production structure. Major tea-producing regions such as Assam and West Bengal produce large quantities of strong-flavoured black tea that is highly suitable for blending in international markets. These varieties are widely used by global tea companies in the preparation of blended teas sold in different countries. As a result, bulk shipments of black tea form the backbone of India's tea export industry and contribute substantially to the country's export earnings (GKToday, 2024).

The second most important category is HS Code 090230 which represents black tea in smaller packaging. Exports in this category increased gradually from US$ 64.41 million in the year 2014 to US$ 112.95 million in 2024. This increase indicated growing international demand for packaged black tea. In contrast, the two other HS Codes 090210 and 090220 indicates relatively lesser export values throughout the period. While minor fluctuations were observed their overall contribution remains limited compared with black tea exports. Therefore, from this analysis it is observed that India's tea export structure is strongly dominated by black tea, particularly bulk tea exports. The dominance of HS Code 090240 in India's export basket reflects both the country's production pattern and the structure of the international tea market, where bulk black tea remains the most widely traded form of tea.

Percentage Share of Tea Export Categories

The percentage share of each category in the total tea exports is shown in figure 3 below.

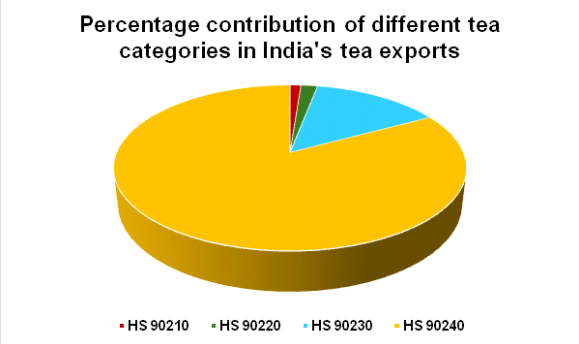


Figure 3: Percentage contribution of different tea categories in India's tea exports
Source: UN Comtrade

Figure 3 reveals that HS Code 090240 accounts for the largest share of India's tea exports contributing approximately 83% of total tea exports. This reveals that a large portion of Indian tea exports consists of bulk black tea which is typically exported in large packaging for blending and repackaging in importing countries. HS Code 090230 accounts for approximately 14% of total tea exports and it represents black tea exported in smaller packaging. The green tea categories HS Code 090220 and HS Code 090210 contributes about 2% and 1% respectively of total tea exports. The percentage share analysis clearly reveals that India's tea export basket is heavily concentrated in black tea exports with green tea exports playing a relatively minor role.

Growth Rate Analysis

The growth rate analysis was conducted to examine the changes in export performance year wise for each category of tea exports. It is represented in table 1. The results show that growth rates vary significantly across different categories. The export of HS Code 090210 (green tea in small packaging) indicates considerable volatility. Its exports declined sharply by 30.52% in the year 2016 followed by a considerable increase of 117.15% in 2017. A decline of 36.92% was again observed in 2023 followed by a recovery of 25.56% in 2024.

Growth Rate of Tea Export								
Year	HS Code 90210 (in US$ million)	Growth Rate of HS Code 90210	HS Code 90220 (in US$ million)	Growth Rate of HS Code 90220	HS Code 90230 (in US$ million)	Growth Rate of HS Code 90230	HS Code 90240 (in US$ million)	Growth Rate of HS Code 90240
2014	3.12		10.83		64.41		577.85	
2015	3.37	8.07	10.91	0.65	63.53	-1.37	600.13	3.86
2016	2.34	-30.52	14.05	28.87	66.27	4.33	579.05	-3.51
2017	5.09	117.15	13.64	-2.92	75.39	13.75	674.07	16.41
2018	6.05	18.84	14.23	4.32	63.82	-15.35	682.01	1.18
2019	7.89	30.49	15.19	6.72	70.12	9.87	720.55	5.65
2020	9.39	19.01	15.30	0.71	86.64	23.56	580.75	-19.40
2021	12.17	29.59	15.78	3.18	94.40	8.96	565.53	-2.62
2023	7.68	-36.92	13.43	-14.94	89.11	-5.61	596.69	5.51
2024	9.64	25.56	14.65	9.12	112.95	26.76	666.91	11.77

Table 1: Growth Rate of Tea Export

Exports under HS Code 090220 (other green tea) show relatively moderate fluctuations. A notable increase of 28.87% occurred in 2016, while exports declined by 14.94% in 2023 before recovering by 9.12% in 2024. In case of HS Code 090230 (black tea in smaller packaging), exports generally show a positive growth trend. However, growth was observed in the year 2020 of 23.56% and 2024 of 26.76% indicating increasing demand for packaged black tea products. The dominant category, that is, HS Code 090240 (bulk black tea) also experienced fluctuations. While exports grew steadily in several years yet a significant decline of 19.40% was recorded in 2020, followed by a smaller decline of 2.62% in 2021. Exports recovered again in the following years with positive growth rates of 5.51% in 2023 and 11.77% in 2024. Overall, the growth rate analysis indicates that although India's tea exports experience periodic fluctuations, the long-term trend remains positive, particularly for black tea exports.

Conclusion

Tea continues to play an important role in India's agricultural economy and international trade. The analysis reveals that India's tea exports have experienced fluctuations over the years influenced by various factors such as changes in global demand and international market conditions. Despite these fluctuations, the overall export performance indicates recovery and continued importance of tea exports in recent years. The study also highlights that India's tea export structure is strongly dominated by black tea exports particularly bulk black tea classified under HS Code 090240. This category accounts for the majority of India's tea export earnings. In comparison, green tea exports contribute only a small share of the total export basket.

Thus, understanding the trend and composition of tea exports is important for policymakers and industry stakeholders as it provides insights into the structure of India's tea trade. In order to further enhance India's position in global tea industry it must strengthen its production quality, improve its market access and expand export markets.

Acknowledgements :

This is an independent work and it owes nothing to any person or organisation.

Conflict of Interest :

The author declares no conflicts of interest.

Authors' Contribution :

As the sole author, I made equal and full contribution in the present work.

Funding :

No specific funding was received for this research.

Ethics Statement :

No experiment has been done on humans and animals.

Informed Consent :

Proper consent was taken during collection of data and the privacy rights of the subjects have been respected.

References

Das, A., Raju, R., Siddayya, & Sendhil, R. (2021). Export of tea from India in post-WTO era:

Performance and determinants. *Indian Journal of Economics and Development.*

https://www.soed.in/public/article/424

Food and Agriculture Organization. (2022). *World tea market and trade: Medium-term outlook*. https://www.fao.org/3/cc0475en/cc0475en.pdf GKToday. (2024). *India tea exports overview*. https://www.gktoday.in/india-tea-exports/

India Brand Equity Foundation. (2024). *Indian tea industry and exports*. Retrieved from https://www.ibef.org

International Tea Committee. (2022). *Annual bulletin of statistics*. https://www.inttea.com International Trade Centre (ITC). (2022). *Trade Map*. https://www.trademap.org

Kumar, N. (2018). Competitiveness and performance of tea exports of India. *Arthshastra: Indian Journal of Economics & Research*. https://doi.org/10.17010/aijer/2018/v7i3/130153

Mathur, V. C., & Vasisht, A. K. (1994). An analysis of fluctuations in unit values, quantum and export values of tea. *Agricultural Economics Research Review.* https://ageconsearch.umn.edu/record/265836

Radhika, A. M., Hoti, A., & Raju, R. (2024). Tea trade scenario in the pre and post liberalization period in India. *Academic Journal of Interdisciplinary Studies*. https://www.richtmann.org/journal/index.php/ajis/article/view/13775

Tea Board of India. (2022). *Annual report 2021–22*. https://www.teaboard.gov.in

Tea Board of India. (2024). *Tea statistics and export data*. Ministry of Commerce and Industry, Government of India. https://www.teaboard.gov.in

The Adivasis. (2024). *India tea export market analysis*. https://theadivasis.in/indias-tea-industry-set-to-shatter-records-with-1-billion-export-target-find-out-how?

UN Comtrade. (2024). *International trade statistics database*. United Nations.

UNCTAD. (2018). *Commodity dependence and price volatility*. https://unctad.org/topic/commodities

Verma, R. (2022). *Trade barriers and export structure of Indian tea*. https://cc.iift.ac.in/research/Docs/WP/EC-26-82.pdf

WorldBank. (2020). *Agriculture and food exports*. https://www.worldbank.org/en/topic/agriculture

World Customs Organization. (2019). *What is the Harmonized System?* https://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized-syste.

Siksha Samhita Journal PDUAMD (2025) Vol 1(1):7-13; **ISSN : 3107-6335**

S.S.J.
PDUAMD

Role of Artificial Intelligence (AI) in Shaping Future Education in Life Sciences

Kumar Kritartha Kaushik[1]
Bismita Medhi[2]
[1]Department of Zoology, Sipajhar College, Sipajhar, Darrang, Assam, India- 784145
[2]Department of Education, Sipajhar College, Sipajhar, Darrang, Assam, India- 784145 Email: kritartha@sipajharcollege.ac.in

Abstract :
The integration of Artificial Intelligence (AI) in education has revolutionized teaching and learning methodologies across disciplines. In life sciences, AI has the potential to enhance personalized learning, facilitate research, and improve data-driven decision-making. This paper explores the role of AI in shaping future education in life sciences, emphasizing its applications in biotechnology, genetics, environmental sciences, and medical education. The study provides insights into AI-driven innovations such as adaptive learning, virtual labs, intelligent tutoring systems, and predictive analytics, offering a comprehensive view of AI's transformative impact on life sciences education.

Keywords: Artificial Intelligence, Life Sciences, Personalized Learning, Virtual Laboratories, Education Technology, AI-assisted Research.

Introduction :
The rapid advancements in AI have significantly influenced various sectors, including education. In lifesciences, where complex biological systems and data analysis areintegral, AI-driven tools provide efficient solutions for enhancing learning outcomes (Luckin et al., 2016). Life sciences education encompasses a diverse range of disciplines, including molecular biology, biotechnology, ecology, and medical sciences. AI integration in this domain enhances knowledge acquisition, improves research efficiency, and facilitates data-driven discoveries (Majeed & Hwang, 2021).

As life sciences deal with the understanding of living organisms, AI applications help in interpreting large biological datasets, automating experimental procedures, and modeling biological systems with precision (Bhardwaj, Kishore, & Pandey, 2022). AI-powered learning tools provide students with interactive experiences, such as real-time simulations of biological processes, AI-guided laboratory experiments, and virtual dissections, which were previously limited by traditional educational approaches (Han & Dou, 2024). Moreover, AI can bridge the gap between theoretical knowledge and real-world application by providing students with industry-relevant exposure, such as the use of AI in drug discovery, epidemiology, and genetic engineering (Zhavoronkov, Vanhaelen, Oprea, & Therapeutics, 2020).

Furthermore, AI enhances collaborative learning by connecting students and researchers across the globe through AI-powered platforms (Jony & Hamim, 2024). AI-driven predictive analytics assist educators in identifying students' learning patterns and challenges, allowing for more targeted interventions (Strielkowski, Grebennikova, Lisovskiy, Rakhimova, & Vasileva, 2024). The growing importance of AI in life sciences education necessitates a structured approach to integrating AI into curricula, ensuring that students are equipped with both scientific knowledge and computational literacy (Schmallenbach, Bärnighausen, &Lerchenmueller, 2024).

This paper investigates the current and future role of AI in life sciences education, highlighting key innovations, challenges, and ethical considerations. It aims to analyze AI's influence on pedagogy, curriculum development, and student engagement in biological sciences. By examining the transformative impact of AI on life sciences education, this study provides a

roadmap for educators, researchers, and policymakers to harness AI effectively for the advancement of biological education and research.

AI Technologies in Life Sciences Education

Adaptive Learning Systems

AI-powered adaptive learning platforms use sophisticated machine learning algorithms to assess students' strengths, weaknesses, and learning preferences. These systems continuously adjust the instructional content to optimize comprehension and retention (Dutta et al., 2024). In lifesciences education, adaptive learning facilitates a deeper understanding of complex topics suchas genomics, evolutionary biology, and metabolic pathways. Platforms like AI-driven biology tutors provide personalized learning experiences that reinforce key concepts through interactive exercises and real-time feedback, ensuring students grasp fundamental biological mechanisms before progressing to advanced topics (Selvam, 2024).

Virtual and Augmented Reality (VR/AR) in Life Sciences

Virtual and augmented reality applications revolutionize life sciences education by enabling students to interact with 3D models of biological systems (Barrow, Forker, Sands, O'Hare, & Hurst, 2019). These technologies provide immersive experiences such as virtual dissections, allowing students to study human and animal anatomy in detail without the ethical concerns of traditional dissections. AR overlays enhance understanding by superimposing molecular structures onto real-world environments, aiding in the visualization of protein interactions, genetic pathways, and ecological systems (Jenkinson, 2018). These AI-powered VR/AR tools bridge the gap between theoretical learning and hands-on experimentation, making biology, biochemistry, and medical sciences more accessible and engaging.

Intelligent Tutoring Systems (ITS)

AI-driven ITS provide personalized academic support in life sciences by guiding students through complex problem-solving exercises and experiments (Selvam, 2024). These systems leverage natural language processing (NLP) and deep learning algorithms to answer queries, suggest learning pathways, and provide explanations tailored to each student's level of understanding (Mejeh, Rehm, & development, 2024). In subjects like microbiology and biochemistry, ITS can simulate lab experiments, assist in troubleshooting procedural errors, and predict potential outcomes based on varying conditions. Additionally, AI-enhanced tutoring platforms help bridge knowledge gaps by analyzing student responses and tailoring subsequent learning activities accordingly (Admane et al., 2024).

AI-Enhanced Research and Data Analysis

Life sciences research involves extensive data analysis, ranging from genetic sequencing to environmental monitoring. AI algorithms play a crucial role in interpreting large datasets, identifying patterns, and predicting biological behaviors (Biswas & Chakrabarti, 2020). In bioinformatics education, AI tools help students analyze genomic sequences, construct phylogenetic trees, and predict protein structures with high accuracy (X. Zhang et al., 2024). In ecological studies, AI-powered models process satellite imagery and climate data to predict biodiversity trends and environmental changes (Srivastava & Sharma, 2024). AI-driven research assistants enable students and educators to explore new frontiers in biomedical research, drug discovery, and synthetic biology by automating dataanalysis and hypothesis testing, accelerating scientific discovery and innovation.

AI-Powered Laboratory Simulations

Traditional life sciences education often requires access to physical laboratories, which can be costly and resource-intensive. AI-powered virtual labs provide a cost-effective alternative, allowing students to conduct experiments in a simulated environment (X. J. J. o. T. I. o. E. S. B. Zhang, 2025). These platforms replicate real-world laboratory conditions and equipment, enabling students to perform chemical reactions, analyze cell cultures, and simulate ecological experiments without the need for physical specimens or hazardous materials (Ali, Ullah, Khan, & interaction, 2022). Virtual labs also allow students to repeat experiments multiple times, reinforcing learning and fostering a deeper understanding of scientific methodologies.

By integrating AI-driven technologies into life sciences education, institutions can enhance student engagement, improve learning outcomes, and facilitate cutting-edge research. These advancements not only make life sciences education more interactive and efficient but also prepare students for the evolving demands of scientific and medical careers.

The Impact of AI on Teaching and Learning in Life Sciences

Personalized Education

AI enables tailored learning experiences, accommodating different cognitive abilities and learning styles (Ezzaim, Dahbi, Aqqal, & Haidine, 2024). In life sciences, this means students can focus on specific areas of difficulty, such as metabolic pathways, immunological responses, or ecological interactions, ensuring a deeper and more meaningful understanding of the subject matter (Hallsworth et al., 2023). AI-driven personalized education platforms help

students navigate complex scientific theories with real-world applications (Rane, Choudhary, & Rane, 2023).Additionally, AI-powered recommendation systems analyze students'progressand suggest supplementary resources, including scientific papers, interactive simulations, and customized assessments to reinforce their understanding (Dhananjaya, Goudar, Kulkarni, Rathod, & Hukkeri, 2024).

Improved Engagementand Interactivity Gamification and interactive simulations powered by AI enhance student engagement and comprehension (Bachiri, Mouncif, & Bouikhalene, 2023). For example, AI-driven simulation platform senable students to conduct virtual experiments on enzymereactions, geneticmutations, or ecological food chains, making theoretical concepts more tangible and engaging. AI-powered laboratory simulations also provide an opportunity for students to practice experimental techniques, such as CRISPR gene editing or microbial culturing, without requiring access to a physical lab (Vindman et al., 2024). Virtual reality (VR) and augmented reality (AR)applications further enhance engagement by enabling students to explore 3D models ofmolecular structures, cellular processes, and biological systems in an immersive learning environment (Barrow, 2022).

Automated Assessments and Feedback Mechanisms
AI facilitates automated grading and feedback, reducing teacher workload while providing students within stante valuations of their progress (Gnanaprakasam & Lourdusamy, 2024). Inlife sciences courses, AI-based assessment tools can analyze students' written responses on lab reports and research papers, ensuring accurate and timely feedback. AI-powered grading can be applied to multiple-choice tests, essays on biological concepts, and research proposals,enhancing the evaluation process and academic integrity (Al Shuraiqi et al., 2024). Furthermore, AI-driven formative assessments use machine learning algorithms to detect knowledge gaps and adjust coursework accordingly, helping students achieve mastery in complex biological topics (Oladele, Ethics, & Education).

Collaboration and Accessibility
AI- driven tools bridge the gap for students with disabilities and offer remote learning opportunities, increasing accessibility in life sciences education (Singh, Reddy, Murthy, Nag, & Doss, 2025). AI-powered transcription services and adaptive content delivery ensure thatstudents with diverse needs can effectively engage with complex biological topics. In addition, AI-enabled global collaboration platforms facilitate research and knowledge sharing among students and educators across different institutions, promoting interdisciplinary learning in fields such as synthetic biology and environmental conservation (Nagaraj, Kalaivani, Begum, Akila, & Sachdev, 2023). AI-driven language processing tools also assist non-native English speakers in comprehending complex scientific literature, broadening educational accessibility on an international scale (Tatipang et al., 2024).

By integrating AI into life sciences education, institutions can provide more dynamic and inclusive learning experiences. These technologies enable personalized instruction, enhance student engagement, and improve assessment methods, preparing students for careers in rapidly evolvingscientificfields. AsAIcontinues to evolve, its rolein shapingthe futureof education in life sciences will become increasingly significant, fostering a generation of scientists and researchers equipped with both biological expertise and computational proficiency.

Challenges and Ethical Considerations

DataPrivacyand Security
One of the primary challenges in implementing AI in life sciences education is ensuring data privacy and security. AI-driven educational tools often require access to vast amounts of student datat opersonalize learning experiences. However, the storage and use of this data rai seconcerns about unauthorized access, data breaches, and misuse of sensitive information (Ibrahim, Thiruvady, Schneider, & Abdelrazek, 2020). Institutions must comply with regulations such as the General Data Protection Regulation (GDPR) and the Family Educational Rights and Privacy Act (FERPA) to protect student data. Developing secure AI frameworks with encryption and anonymization methods is crucial for mitigating privacy risks (Villegas-Ch & García-Ortiz, 2023).

Bias and Fairness in AI Algorithms
AI systems rely on algorithms trained on large datasets, which may inadvertently contain biases that can affect decision-making processes in education (Osasona et al., 2024). In life sciences education, biased AI models could lead to disparities in student assessments, personalized learning recommendations, and grading systems. For example, AI may favor students from certain backgrounds based on its training data, inadvertently creating inequality in learning opportunities (Li & Research, 2023). To mitigate these biases, educators and developers must continuously audit AI algorithms, incorporate diverse training data, and implement fairness-aware machine learning techniques.

Teacher Adaptation and Training

The successful integration of AI in life sciences education requires educators to be well-versed in AI technologies and their applications (Karampelas & Education, 2025). Many teachers may face challenges in adapting to AI-driven tools due to a lack of technical knowledge or resistance to change. Providing comprehensive training programs and professional development opportunities can help educators understand how to effectively utilize AI in teaching and research. Additionally, institutions should fostera culture of AI literacy, ensuringthat faculty members are equipped with the skills necessaryto interpret AI-generated insights and integrate AI-based tools into their pedagogical strategies (Alqahtani & Wafula, 2024).

Over-relianceon AI and Reduced Human Interaction

While AI offers numerous benefits in life sciences education, an over-reliance on AI-driven learning tools may diminish human interaction and critical thinking skills among students (Moemeke, 2024). Traditional classroom environments provide opportunities for discussions, debates, and hands-on experiments that foster creativity and critical analysis. AI, when used excessively, could reduce the role of educators and limit students' ability to engage in independent problem-solving. A balanced approach is necessary, where AI serves as a supplementary tool rather than a complete replacement for traditional teaching methods. Encouraging collaborative learning and human-AI interaction can enhance the overall educational experience (Edwards et al., 2024).

Ethical Concerns in AI-Generated Knowledge

AI-driven educational platforms in life sciences generate vast amounts of information, some of which may be prone to inaccuracies or ethical dilemmas. For example, AI-powered simulations in biotechnology or genetic engineering could present ethical concerns related to genetic modifications and cloning (Shalom, 2024). Ethical frameworks must be established to guide the responsible use of AI in life sciences education, ensuring that AI-generated knowledge aligns with ethical research principles and societal values (Qadhi, Alduais, Chaaban, &Khraisheh, 2024). Additionally, students must be educated about the ethical implications of AI in biological sciences, promoting responsible innovation and ethical decision-making in their future careers.

By addressing these challenges and ethical considerations, educators, policymakers, and AI developers can create a robust and responsible AI-driven learning environment in life sciences education. Ethical AI implementation will not only enhance student learning experiences but also ensure fairness, privacy, and academic integrity in the evolving educational landscape.

Future Prospects of AI in Life Sciences Education

The future of AI in life sciences education presents immense opportunities for innovation and advancement. As AI technologies continue to evolve, their applications in teaching and research will become more sophisticated, allowing for more personalized and efficient learning experiences. The integration of AI is expected to revolutionize various aspects of life sciences education, including curriculum design, research methodologies, and collaborative learning environments.

Advanced AI- Driven Personalized Learning

Future advancements in AI will enable highly personalized learning experiences tailored to each student's cognitive abilities and learning pace (Castro, Chiappe, Rodríguez, & Sepulveda, 2024). AI will continuously assess students' progress, adapt content delivery, and provide real-time feedback to enhance comprehension and retention. This will be particularly valuable in complex subjects like genomics, neuroscience, and bioinformatics, where students often struggle with intricate concepts. AI-powered intelligent tutors will provide one-on-one coaching, helping students bridge knowledge gaps efficiently (Singh et al., 2025).

Expansion of Virtual and Augmented Reality (VR/AR) Applications

The use of AI-driven VR and AR in life sciences education will expand further, offering more immersive and interactive learning experiences (Al Balushi et al., 2024). Future applications will allow students to explore 3D models of cells, organs, and ecosystems in greater detail, conduct virtual dissections with real-time AI guidance, and simulate laboratory experiments without requiringphysical specimens.This will not onlyenhancestudent engagement but also reduce the costs and ethical concerns associated with traditional lab-based learning.

AI-Powered Research Assistants and Automated Scientific Discovery

The role of AI in research will continue to grow, providing students and educators with AI-powered research assistants capable of analyzing complex datasets, generating hypotheses, and even conducting preliminary experiments (Cingillioglu, Gal, Prokhorov, & Technologies, 2024). AI-driven bioinformatics tools will further facilitate genomic and proteomic studies, allowing students to conduct advanced research with minimal manual intervention. These advancements will

empower students to engage in high-level scientific inquiry and innovation early in their academic careers.

Integration of AI in Environmental and Biomedical Studies

AI's application in environmental and biomedical sciences will lead to better predictive modeling, allowing students to study climate change impacts, disease outbreaks, and ecological interactions in real time (Kaur, Sandhu, & Kumar, 2022). AI-driven models will enable students to analyze vast ecological datasets, predict biodiversity trends, and assess environmental risks with greater accuracy. In biomedical education, AI-assisted simulations will help students understand disease pathology, drug interactions, and personalized medicine approaches.

Collaborative AI- Driven Global Learning Platforms

The future will witness the emergence of AI-powered global learning platforms that facilitate cross-institutional collaboration (Al-Zahrani, Alasmari, & Technologies, 2025). These platforms will connect students, educators, and researchers worldwide, fostering knowledge exchange and inter disciplinary research. AI will facilitate multilingual learning, breaking language barriers and ensuring accessibility to high-quality life sciences education for students across different regions.

Ethical AI and Responsible Innovation in Life Sciences Education

As AI technologies become more integrated into life sciences education, emphasis will be placed on ethical AI development and responsible innovation (Abulibdeh, Zaidan, & Abulibdeh, 2024). Institutions will develop guidelines to ensure AI-driven education maintains academic integrity, avoids biases, and promotes ethical scientific practices. AI literacy will become an essential part of life sciences curricula, equipping students with the skills to critically assess and apply AI in their respective fields responsibly.

The future prospects of AI in life sciences education are vast and transformative. As AI continues to evolve, it will not only enhance the quality of education but also empower the next generation of scientists, medical professionals, and researchers with the skills and tools necessary for tackling complex global challenges. A strategicand ethical approach to AI integration will be crucial in ensuring its positive impact on education and research in the life sciences.

Conclusion

AI is rapidly transforming life sciences education, transforming teaching methodologies, research capabilities, and learning outcomes. It has made complex biological concepts more accessible to students of varying abilities and learning styles through adaptive learning platforms, intelligent tutoring systems, and virtual laboratories. AI has also revolutionized research in life sciences, enabling students and educators to analyze vast datasets, automate experimental procedures, and predict biological phenomena with unprecedented accuracy. This integration of AI in research-based education is enhancing knowledge retention and preparing students for data-driven scientific careers.

However, the implementation of AI in life sciences education comes with significant challenges, including ethical concerns, data privacy issues, biases in AI-driven assessments, and potential reduction in human interaction in classrooms. Institutions must prioritize responsible AI integration by developing ethical guidelines, ensuring unbiased algorithmic decisions, and promoting AI literacy among educators and students.

The future of AI in life sciences education is promising, with continuous advancements in machine learning, virtual reality, and computational biology shaping the curriculum, fostering collaborative learning, and enhancing research capabilities. A balanced approach must be adopted to maximize the benefits of AI while mitigating risks. By fostering responsible AI innovation and maintaining a student-centered approach, AI can revolutionize life sciences education and equip the next generation of scientists, researchers, and healthcare professionals with the skills needed to tackle future scientific challenges.

Acknowledgements:

The authors express their gratitude to colleagues and well-wishers for their valuable discussions and moral support during the preparation of this manuscript.

Conflict of Interest:

The authors declare no conflicts of interest.

Authors' Contribution:

Both authors contributed equally to the conceptualisation, data analysis, interpretation, and writing of this manuscript.

Funding:

No specific funding was received for this research.

Ethics Statement:

No experiment has been done on humans and animals.

Informed Consent:

Proper consent was taken during collection of data, and the privacy rights of the subjects have been respected.

References

Abulibdeh, A., Zaidan, E., &Abulibdeh, R. J. J. o. C. P. (2024). Navigating the confluence of artificial intelligence and education for sustainable development in the era of industry4.0: Challenges, opportunities, and ethical dimensions. 140527.

Admane,R.,Sawale,P. S.,Jayasree,R.,Kurup, S.J.,Thomas,S.A.J.L. o.P.-L.S., Information Technology, & Computer. (2024). Artificial Intelligence in Education: Tailoring Curriculum to Individual Student Needs through AI-Based Systems. *44*(3).

Al-Zahrani, A.M., Alasmari, T.M.J.E., & Technologies, I.(2025). Acomprehensive analysis of AI adoption, implementation strategies, and challenges in higher education across the Middle East and North Africa (MENA) region. 1-51.

Al Balushi,J. S.G., Al Jabri, M.I.A., Palarimath, S.,Maran, P., Then mozhi, K., & Balakumar,

C. (2024). *Incorporating artificial intelligence powered immersive realities to improve learning using virtual reality (VR) and augmented reality (AR) technology.* Paper presented at the 2024 3rd International Conference onAppliedArtificial Intelligence and Computing (ICAAIC).

Al Shuraiqi, S., Aal Abdulsalam, A., Masters, K., Zidoum, H., AlZaabi, A. J. B. D., & Computing, C. (2024). Automatic Generation of Medical Case-Based Multiple-Choice Questions (MCQs): A Review of Methodologies, Applications, Evaluation, and Future Directions. *8*(10), 139.

Ali, N., Ullah, S., Khan, D. J. M. t., & interaction. (2022). Interactive laboratories for science education: Asubjective study and systematic literature review. *6*(10), 85.

Alqahtani, N., & Wafula, Z. J. I. H. E. (2024). Artificial Intelligence Integration: Pedagogical Strategies and Policies at Leading Universities. 1-20.

Bachiri, Y.-A., Mouncif, H., &Bouikhalene, B. J. I. J. o. E. P. (2023). Artificial intelligence empowers gamification: Optimizing student engagement and learning outcomes in e-learning and moocs. *13*(8).

Barrow, J. (2022). The Future with Extended Reality, Three-Dimensional, and Advanced Imaging for Molecules, Microscopy, and Anatomy. In *Technologies in Biomedical and Life Sciences Education: Approaches and Evidence of Efficacy for Learning* (pp. 519-557): Springer.

Barrow, J., Forker, C., Sands, A., O'Hare, D., & Hurst, W. (2019). Augmented reality for enhancing life science education.

Bhardwaj, A., Kishore, S., & Pandey, D. K. J. L. (2022). Artificial intelligence in biological sciences. *12*(9), 1430.

Biswas, N., &Chakrabarti,S.J.F.i.o.(2020).Artificialintelligence (AI)-basedsystemsbiology approaches in multi-omics data analysis of cancer. *10*, 588221.

Castro, G.P.B., Chiappe, A., Rodríguez, D.F.B., & Sepulveda, F.G.J.E.J.o.e.-L. (2024).

Harnessing AI for Education 4.0: Drivers of Personalized Learning.*22*(5), 01-14.

Cingillioglu, I., Gal, U., Prokhorov, A. J. E., & Technologies, I. (2024). AI-experiments in education:AnAI-driven randomized controlled trial for higher education research. 1-29.

Dhananjaya, G., Goudar, R., Kulkarni, A., Rathod, V. N., &Hukkeri, G. S. J. I. A. (2024). A Digital Recommendation System for Personalized Learning to Enhance OnlineEducation: A Review.

Dutta, S., Ranjan, S., Mishra, S., Sharma, V., Hewage, P., &Iwendi, C. (2024). *Enhancing educationaladaptability:AreviewandanalysisofAI-drivenadaptivelearningplatforms.* Paper presented at the 2024 4th International Conference on Innovative Practices in Technology and Management (ICIPTM).

Edwards, J., Nguyen, A., Lämsä, J., Sobocinski, M., Whitehead, R., Dang, B.,...Järvelä, S.J.

B. J. o. E. T. (2024). Humanû%AI collaboration: Designing artificial agents to facilitate socially shared regulation among learners.

Ezzaim, A., Dahbi, A., Aqqal, A., &Haidine, A. J. J. o. C. i. E. (2024). AI-based learning style detection in adaptive learning systems: a systematic literature review. 1-39.

Gnanaprakasam, J., &Lourdusamy, R. (2024). The role ofAI in automating grading: Enhancing feedback and efficiency. In *Artificial Intelligence and Education-Shaping the Future of Learning*: IntechOpen.

Halls worth, J.E., Udaondo, Z., Pedrósû%Alió, C., Höfer, J.,Benison, K.C., Lloyd, K.G.,...

Amils, R.J.M.B. (2023). Scientific novelty beyond the experiment.*16*(6),1131-1173.

Han, Z., & Dou, Q. J. C.A. S. (2024).Areview on organ deformation modeling approaches for reliable surgical navigation using augmented reality. *29*(1), 2357164.

Ibrahim, A., Thiruvady, D., Schneider, J.-G., & Abdelrazek, M. J. F. i. C. S. (2020). The challenges of leveraging threat intelligence to stop data breaches. *2*, 36.

Jenkinson, J. J. J. o. m. b. (2018). Molecular biology meets the learning sciences: Visualizations in education and outreach. *430*(21), 4013-4027.

Jony,A. I., & Hamim, S.A. J. E. T. Q. (2024). Empowering virtual collaboration: harnessingAI for enhanced teamwork in higher education. *2024*(3), 337-359.

Karampelas, K. J. C. M., & Education, S. (2025). Integration of artificial intelligence in national science curricula. *6*(1).

Kaur, I., Sandhu, A.K., & Kumar, Y.J.A.o.C.M.i.E.(2022). Artificial intelligence techniques for predictive modeling of vector-borne diseases and its pathogens: a systematic review. *29*(6), 3741-3771.

Li, H. J.A. i. E., Humanities, & Research, S. S. (2023).AI in Education: Bridging the Divide or Widening the Gap? Exploring Equity, Opportunities, and Challenges in the Digital Age. *8*(1), 355-355.

Majeed, A., & Hwang, S. O. J. S. (2021). Data-driven analytics leveraging artificial intelligence in the era of COVID-19: an insightful review of recent developments. *14*(1), 16.

Mejeh, M., Rehm, M. J. E. t. r., & development. (2024).Taking adaptive learning in educational settings to the next level: Leveraging natural language processing for improved personalization. 1-25.

Moemeke, C. D. J. N. J. o. E. R. (2024). Artificial Intelligence and Machine Learning in enhancing Science Learning Experiences: Exploring Possibilities and Concerns. *10*(2), 59-72.

Nagaraj, B. K., Kalaivani,A., Begum, S.,Akila, S., & Sachdev, H. K. J. I. R. J. o. M. T. (2023). The emerging role of artificial intelligence in stem higher education: A critical review. *5*(5), 1-19.

Oladele, B. J.A., Ethics,A. I., & Education, t. F. o. Q.A. i. H.Artificial Intelligence in Higher Education Research Evaluation: Current Trends, Efficacy, and Ethical Considerations.

Osasona, F.,Amoo, O. O.,Atadoga,A.,Abrahams,T. O., Farayola, O.A.,Ayinla, B. S. J. I. J. o. M., & Research, E. (2024). Reviewing the ethical implications ofAI in decision making processes. *6*(2), 322-335.

Qadhi, S. M., Alduais, A., Chaaban, Y., &Khraisheh, M. J. I. (2024). Generative AI, Research Ethics, and Higher Education Research: Insights from a Scientometric Analysis. *15*(6), 325.

Rane, N., Choudhary, S., & Rane, J. J. A. a. S. (2023). Education 4.0 and 5.0: Integrating artificial intelligence (AI) for personalized and adaptive learning.

Schmallenbach, L., Bärnighausen, T. W., &Lerchenmueller, M. J. J. N. C. (2024). The global geography of artificial intelligence in life science research. *15*(1), 7527.

Selvam, A. A. A. J. J. o. B. I. i. S. (2024). Exploring the impact of artificial intelligence on transforming physics, chemistry, and biology education.

Shalom, J. B. (2024). The Role ofArtificial Intelligence (AI) in Biotechnology Manufacturing. Singh, T.M., Reddy, C.K.K., Murthy, B.R., Nag, A., & Doss, S.(2025). Ai and education:

Bridging the gap to personalized, efficient, and accessible learning. In *Internet of Behavior-Based Computational Intelligence for Smart Education Systems* (pp. 131-160): IGI Global.

Srivastava, A., & Sharma, H. (2024). AI-driven environmental monitoring using Google Earth Engine. In *IoT Sensors, ML, AI and XAI: Empowering A Smarter World* (pp. 375-385): Springer.

Strielkowski, W., Grebennikova, V., Lisovskiy, A., Rakhimova, G., & Vasileva, T. J. S. D. (2024).AIû%driven adaptive learning for sustainable educational transformation.

Tatipang, D. P., Pontillas, M. S.,Alrajafi, G., Rovikasari, M., Ndruru, F. J. J. o. E. C., Language, Literature, & Education. (2024). The Interplay Among AI, Language Research, and Academic Publishing:ASystematic Review ofTrends and Future Directions. *12*(2), 215-237.

Villegas-Ch, W., & García-Ortiz, J. J. E. (2023). Toward a comprehensive framework for ensuring security and privacy in artificial intelligence. *12*(18), 3786.

Vindman,C.,Trump,B., Cummings, C., Smith, M., Titus,A.J., Oye, K., ...Linkov, I.J.a.p.a. (2024). The Convergence ofAI and Synthetic Biology: The Looming Deluge.

Zhang, X., Ibrahim, Z., Khaskheli, M. B., Raza, H., Zhou, F., & Shamsi, I. H. J. S. (2024). Integrative approaches to abiotic stress management in crops: combining bioinformatics educational tools and artificial intelligence applications. *16*(17), 7651.

Zhang, X. J. J. o. T. I. o. E. S. B. (2025). Internet of Things and Cloud Computing-Powered Virtual Laboratories for Enhanced STEM Education. 1-10.

Zhavoronkov, A., Vanhaelen, Q., Oprea, T. I. J. C. P., & Therapeutics. (2020). Will artificial intelligence for drug discovery impact clinical pharmacology?, *107*(4), 780-785.

Siksha Samhita Journal PDUAMD (2025) Vol 1(1):14-20; **ISSN : 3107-6335**

S.S.J.
PDUAMD

Empowering Women Political Participation Through Artificial Intelligence in Assam

Dr. Indrani Kalita
AssistantProfessor
Krishna Kanta Handiqui State Open University, Assam
Email: indrani.kalita2012@gmail.com

Abstract :
Political participation and engagement are among the many facets of human existence that artificial intelligence (AI) is rapidly transforming (OECD, 2019; UNESCO, 2021). AI has the potential to be a game-changing tool in regions like Assam, India, where socioeconomic and cultural constraints frequently prevent women from participating in politics (Sharma & Das, 2022). This paper examines how AI can empower women's political participation in Assam by enhancing awareness, reducing barriers, and fostering inclusivity. It also explores the challenges and ethical concerns associated with leveraging AI in this context (Floridi et al., 2018; Zuboff, 2019). By integrating case studies, statistical analysis, and theoretical frameworks, this study highlights both the opportunities and limitations of AI in bridging gender gaps in political engagement (UN Women, 2023; World Economic Forum, 2024).

Keywords: Artificial Intelligence, Women Political Participation, Socio-Cultural Barriers, Gender Gaps in Politics.

Introduction :
Political participation is an essential component of democracy, yet in many parts of the world, including Assam, women's representation and engagement in politics remain limited (UN Women, 2023). Despite constitutional obligations and government initiatives to promote gender equality, socio-cultural hurdles, a lack of awareness, and financial constraints frequently prevent women from actively participating in political processes (Kabeer, 2016; Caraway & Htun, 2020).

Assam, which has a significant indigenous and migrant population, faces particular challenges concerning women's empowerment and political engagement (Borah, 2021). Despite advances in some areas, including increased representation in Panchayati Raj Institutions, women's engagement in the state's broader political landscape remains limited. For example, Assam recorded only 15.7% female representation in its Legislative Assembly in 2021, highlighting the persistent gender gap in political representation (Election Commission of India, 2024). This disparity underscores the need for targeted interventions to increase women's participation in the democratic process, not only as voters but also as candidates, decision-makers, and active political actors (UN Women, 2023).

Several factors contribute to the low level of female engagement in Assam's political processes, including socio-cultural norms, limited political awareness, gender bias, and economic dependence (Borah, 2021; Kabeer, 2016). Furthermore, the traditional political system, which is often dominated by male leadership, provides limited opportunities for women's voices to be heard and represented effectively (Caraway & Htun, 2020). Given this context, there is an urgent need to create inclusive pathways for women's political participation, and artificial intelligence offers promising possibilities in this regard.

With the advancement of AI technologies, new opportunities have emerged to address these longstanding challenges (OECD, 2019; NITI Aayog, 2021). From data-driven policy formulation to AI-powered educational tools and civic engagement platforms, technology possesses considerable potential to enhance women's political participation (Margetts,

2017; Government of India, 2023). However, its effectiveness depends on addressing structural inequalities, digital exclusion, and ethical concerns related to algorithmic bias, privacy, and data governance (Floridi et al., 2018; UNESCO, 2021; Zuboff, 2019).

This study investigates how artificial intelligence can act as a catalyst for empowering women in Assam's political landscape while critically examining the associated opportunities, risks, and limitations. By exploring the intersection of technology, gender, and democratic participation, the paper contributes to the growing discourse on digital empowerment and inclusive governance in contemporary India (Sharma & Das, 2022; UNDP, 2023).

The Socio-Political Landscape of Women in Assam

Assam, India's north-eastern state, has a diverse ethnic composition, linguistic plurality, and rich cultural heritage. Despite these strengths, gender inequalities continue to persist in several spheres, including political participation (Borah, 2021; UN Women, 2023). Women in Assam encounter numerous barriers that restrict their active engagement in politics and governance.

- **Cultural norms and patriarchy:** Traditional social structures and patriarchal norms often limit women's access to decision-making processes and political leadership positions (Kabeer, 2016; Caraway & Htun, 2020).
- **Economic dependence:** Limited access to education, employment, and financial resources reduces women's autonomy and their capacity to participate effectively in political activities (World Bank, 2023; Kabeer, 2016).
- **Lack of awareness:** Inadequate awareness of political rights, electoral processes, and leadership opportunities further restricts women's involvement in democratic institutions (Sharma, 2021; UN Women, 2023).

Government initiatives, such as reservation policies, self-help groups (SHGs), and women-centric development programmes, have attempted to address these challenges, though significant gaps remain (Government of Assam, 2023). Artificial intelligence technologies can complement these efforts by providing scalable and innovative solutions to enhance awareness, participation, and leadership among women (OECD, 2019).

Role of AI in Empowering Women's Political Participation

Artificial intelligence has emerged as a significant enabler of political empowerment by addressing issues related to awareness, accessibility, participation, and leadership (OECD, 2019; NITI Aayog, 2021).

One important avenue is political awareness. AI-powered platforms, chatbots, and mobile applications can disseminate information regarding political rights, voting procedures, government schemes, and public policies in local languages (Government of India, 2023; UNESCO, 2021). Localized content generation can improve access to information among women from diverse linguistic and cultural backgrounds in Assam (Sharma & Das, 2022).

Interactive AI-based tools, including quizzes, virtual assistants, and gamified learning applications, can promote civic education and encourage political engagement among women (Margetts, 2017). Such technologies have demonstrated significant potential for increasing civic awareness and digital participation worldwide (Bimber, 2003).

AI can also reduce barriers to participation through digital inclusion initiatives. Voice-based assistants and speech-recognition technologies can support illiterate and semi-literate women by enabling access to political information without requiring advanced literacy skills (UNESCO, 2021; ITU, 2023).

Furthermore, AI-enabled systems can improve transportation planning, information dissemination, and logistical support for women participating in political meetings, campaigns, and elections (World Bank, 2024). Such innovations can significantly reduce mobility constraints, which remain a major obstacle to women's political engagement in rural Assam (Sharma & Das, 2022).

Beyond awareness and accessibility, AI can contribute to leadership development. Predictive analytics and machine learning techniques can identify emerging women leaders through analyses of community participation, grassroots activism, and digital engagement (UNDP, 2023). AI-powered mentorship networks can connect aspiring women leaders with experienced mentors, thereby fostering confidence, leadership skills, and political ambition (UN Women, 2023).

E-Rozgar (assam): E-Rozgar, an Assam government initiative, employs technology to provide women with professional support and employment options, particularly in rural areas.This effort could be expanded by include AI-powered modules that provide political

empowerment toolsand guide women in using their digital literacy abilities to participate in local governance and politics.

ShePower by the UNDP India: The United Nations Development Programme (UNDP) has started the "ShePower" project to boost women's political representation in India. While it is a national initiative, it might be replicated in Assam by employing AI-powered platforms to track women's political participation and the efficacy of training programmes.

Case Studies and Application

In Assam, women's political participation remains relatively low, particularly among rural, tribal, and marginalized communities (Borah, 2021). However, AI-driven interventions have the potential to significantly improve awareness, engagement, and representation.

AI for Political Awareness: Mobile Applications

Digital platforms have become increasingly important tools for political communication and civic engagement (Bimber, 2003). AI-powered mobile applications can provide women with information regarding voting rights, electoral procedures, government welfare schemes, and leadership opportunities (Government of India, 2023).

Examples from Assam include-The MyGov platform represents an example of technology-enabled citizen engagement. Through machine-learning algorithms and personalized communication tools, the platform facilitates interaction between citizens and government institutions (MyGov India, 2021). Similar localized platforms could be developed in Assam to educate women regarding political participation and democratic rights.

AI-Powered Social Campaigns

Social media sites such as Facebook, Twitter, and Instagram are increasingly adopting AI algorithms to push content, making them effective tools for political campaigns. In Assam, AI can be used to develop targeted social campaigns aimed at improving women's political engagement by promoting awareness about voting, election procedures, and female representation in politics.

AI-driven campaigns in Assam

• ***#Vote For Women campaign:*** NGOs and women's rights organizations in Assam might work together to establish AI-powered social media campaigns like #Vote For Women, which use social media platforms to target women, particularly in rural and tribal areas. AI systems can analyze user behavior, interests, and location to personalize messages that address the distinct difficulties that women face in various regions of Assam. Women in Assam's tea garden regions, for example, who frequently confront systemic social and economic issues, may receive customized advertisements and messaging about the importance of voting, how to register, and what local candidates stand for.

• ***Facebook's AI-Powered Ad System:*** Platforms such as Facebook are already using AI algorithms to target certain demographics with relevant content. Women in Assam could be targeted through these channels with adverts aimed at political empowerment. For example, a localized ad campaign may highlight the contributions of women leaders in Assam, such as the late Indira Goswami, a well-known writer and political activist, or Rani Gaidinliu, an iconic independence warrior from Nagaland who had a big impact on Assam. By tailoring these ads based on geographic and cultural characteristics, social media platforms can raise political awareness among women in locations where traditional campaigns may not be as effective.

• ***AI for Gender-Specific Content Creation:*** AI methods such as natural language processing (NLP) can be used to generate gender-specific political content that appeals to women. For example, AI can be used to evaluate the language used in Assam's local politics in order to detect and overcome gender prejudices that may dissuade women from engaging in politics. Campaigns might focus on educating women about how to overcome these hurdles and participate more effectively in political discourse. Furthermore, machine learning algorithms might assist track and assess the success of these campaigns by tracking metrics like engagement rates, shares, and comments, allowing organizers to fine-tune their strategy in real time.

• ***Initiatives at the Community Level Using AI:*** At the grassroots level, artificial intelligence (AI) can play an important role in tracking and analyzing trends linked to female political engagement. By gathering data and analyzing patterns, AI techniques can assist NGOs in Assam in developing more effective and context-specific initiatives to involve women in politics. We can site some ways through which AI can be integrated at grassroot level to increase women's participation in politics:

• **Tracking Women's Participation:** Artificial intelligence can assist NGOs and political organizations in Assam in tracking women's participation in municipal elections, community meetings, and other political events. They can use machine learning algorithms to assess historical data on women's voting habits, election participation rates, and regional trends. This information can then be used to identify locations where women's engagement is low and to create targeted initiatives. For example, in

Assam's tea garden areas, where women make up a sizable proportion of the population, AI could assist in tracking voter turnout and identifying locations where women's political participation is particularly low. This would enable organizations to undertake targeted campaigns in certain locations.

• **AI-Powered Surveys and Polls:** Non-governmental organizations (NGOs) can employAI-platforms to conduct surveys and polls about women's political awareness and involvement. AI can evaluate replies to find trends and patterns that may not be obvious at first glance, such as regional differences in women's political interest or specific impediments that women face while participating in political activities. For example, in Assam's Bodoland Territorial Region (BTR), AI-powered surveys could assist assess the cultural and logistical constraints that prohibit women from votingor running for office. Based on this information, NGOs might create culturally appropriate programs to boost engagement in these areas.

• **Personalized Political Training Programs:** Based on the data gathered, AI could assist NGOs in developing personalized political training programs for women in Assam. Machine learning models, for example, may assess women's present political activity and offer specialized training modules to help them develop abilities like public speaking, leadership, and campaign management. By personalizing training to specific requirements, AI ensures that women have the assistance and education they require to participate in local elections and government.

Challenges and Ethical Concerns in using AI for Women's Political Empowerment in Assam

While artificial intelligence has enormous promise for increasing women's political engagement, particularly in areas like Assam, its implementation is fraught with difficulties and ethical considerations. One of the most important concerns is the ***digital divide.*** Assam, havinga predominantly rural population, has uneven access to technology. Women in remote and rural areas frequently lack the necessary infrastructure to participate in AI-powered politicalawareness campaigns or use mobile applications designed to educate and enlighten them about voting procedures and political activity. Internet access is limited in many areas, and cell phones are uncommon, particularly in lower-income communities like Assam's tea garden districts. Without sufficient access to these tools, women in these locations may be denied the benefits of AI technologies, further marginalizing them in political processes.

Another major concern is ***algorithmic bias,*** which can cause AI systems to perpetuate and magnify existing gender inequalities. AI tools like language models, facial recognition systems, and recommendation algorithms are frequently trained on datasets including historical and societal biases. For example, if these systems are trained on biased data that disproportionately excludes women's opinions or experiences, the AI may fail to appropriately address the specific needs and concerns of Assamese women, or worse, promote damaging stereotypes. In terms of political participation, AI systems designed to analyze women's voting patterns, run empowerment campaigns, or promote political engagement may fail to capture or address the unique barriers that women face in specific communities, particularly in ethnically diverse areas with deeply ingrained gender norms. To ensure that these systems are egalitarian, AI must be built and trained on diverse, inclusive data sets that reflect the realities of women's lives in Assam.

Furthermore, ***privacy and security*** issues are heightened when AI systems collect and analyze personal data, especially for political goals. Women may be cautious to use AI-powered platforms for political education or engagement if they are concerned that their personal information may be exploited or fall into the wrong hands. For example, AI-powered mobileapps that monitor voting behavior, political involvement, or personal preferences may unintentionally exposeusers to data breaches or unlawful surveillance. In Assam, where political conflicts and identity-based concerns are common, data collected for political objectives couldbe abused to target people or communities. This raises major concerns about the security of personal data and the necessity for stringent data governance regulations. Building trust among women, especially those in rural and marginalized communities, will require ensuring that AI systems adhere to privacy standards and provide transparent data usage regulations.

Finally, using AI for political objectives raises various *ethical concerns*. One important concern is the *possibility of misinformation*. AI algorithms, particularly on social media platforms, have the ability to propagate erroneous or misleading information, potentially affecting women's voting decisions and political views. For example, AI-driven algorithms may highlight sensational ordeceptive content that targets femal evoters in Assam based on their preferencesor demographics, potentially contributing to the dissemination of fake news or biased political messages. *Surveillance*is another concern. AI technologies can be used to track people'spolitical behaviour, such as voting choices and participation in political activities. This couldlead to women being monitored, particularly in politically sensitive areas

where some groups may be pressured to conform to specific political ideas or abstain from voting entirely. Finally, AI could have an *excessive influence on voting behaviour*. The use of individualized AI-driven campaigns can influence voters by providing information in a way that gradually shapes their political decisions, thus undermining democratic systems. This form of manipulation isespecially dangerous in Assam, where ethnic and religious identities influence politicaldecisions. The ethical quandary here is striking a balance between empowering women through AI and ensuring that these technologies are not exploited to exploit or influence their political decisions.

Policy Commendations

To effectively use AI to empower women's political engagement in Assam, the following policy initiatives are recommended:

- ***Enhancedigitalinfrastructure:***

a) Expandinternet and mobile connectivity, especially in Assam's rural and remote areas, to ensure fair access to AI-powered technologies.

b) Create public digital hubs where women can use AI technology and training materials.

- ***Promote digital literacy***

a) Launch specialized digital literacy initiatives for women, stressing the use of AI- powered platforms for political education and engagement.

b) Collaborate with non-governmental organizations (NGOs), local institutions, and community groups to provide grassroots training on how to use AI-enabled political tools.

- ***DevelopInclusiveAITools:***

a) Create AI systems with culturally and linguistically inclusive features, including content in Assamese and other regional languages.

b) Use user-friendly interfaces, voice commands, and visual aids to help illiterate or semi-literate people.

- ***Encouragecommunity engagement:***

a) Create AI-powered community engagement platforms to encourage political discourse, allowing women to express their views and connect with local authorities.

b) Use AI to raise awareness about gender equality and the importance of women's participation in governance.

- ***Facilitatedata-drivendecision-making:***

a) Use AI-based data analytics to identify places with low female political engagement and implement targeted interventions.

b) Use AI to track the efficacy of policies and programmsaimedatempowering women politically.

- ***SupportMentorshipandLeadership Programs:***

a) Create AI-powered mentorship networks that connect prospective female leaders with experienced mentors in politics and governance.

b) Use artificial intelligence to identify and highlight potential female leaders based on their grassroots participation and advocacy activities.

- ***EnsureEthicalAI Development***

a) Establish explicitrules for the ethical use of AI in political empowerment, witha focus on privacy, data protection, and algorithmic bias prevention.

b) To avoid mis information and exploitation, make AI algorithms used for political out reach transparent.

- ***Collaboratewithstakeholders.***

a) Collaborate with techbusinesses, academic institutions, and civil society organizations to create AI solutions focused on women's empowerment.

b) Encourage government and business sector partnership to fund and implement AI-driven initiatives.

- ***Incentivizelocal innovation***

a) Provide funds and incentives to entrepreneurs and researchers in Assam to create AI technologies aimed at enhancing women's political engagement.

b) Promote hack at hons and innovation challenges to generate ideas for empowering women with AI.

- **Monitorand Evaluate Impact:**

a) Regularly assess the impact of AI-powered initiatives on women\u2019 spolitical participation and refine strategies accordingly.

b) Collect and analyze gender-disaggregated data to track progress and address emerging challenges.

Conclusion

The potential for Artificial Intelligence (AI) to greatly increase women's political engagement in Assam is vast and transformational. Historically, women in Assam have faced various impediments to active participation in the democratic process, including sociocultural restrictions, economic reliance, and logistical challenges. These barriers have hampered their ability to participate as voters, leaders, and decision-makers in the political arena. AI offers a strong potential to address these difficulties bydeveloping innovative, scalable, and personalized solutions that empower women at all stages of their political careers.

AI can help bridge political awareness gaps by providing localized, accessible platforms that educate women about their rights, voting procedures, and leadership chances. Mobile apps,voice assistants, and AI-powered learning modules in Assamese and other regional languages can successfully reach women with various linguistic and cultural backgrounds. Additionally, AI can improve accessibility by removing logistical constraints. Forexample, AI-powered applications can make it easier to schedule transportation for attending political meeting sorvoting, by passing mobility constraints that frequently impede women in rural and is olated places. Beyond awareness and accessibility, AI can promote women's leadership by identifying rising female leaders through data analysis of grassroots activities and social media involvement. AI-enabled mentorship networks can connect women with political role models, providing advice and support suited to their goals. Predictive analytics can also help governments and non-governmental organizations (NGOs) plan targeted measures to boost women's representation and influence.

While AI has enormous potential, its implementation must be inclusive, ethical, and conscious of issues like the digital divide, algorithmic prejudice, and privacy concerns. By solving these difficulties and increasing collaboration amongs take holders, AI can act as a catalyst for women's political empowerment in Assam, resulting in a more inclusive and equitable democratic process.

Acknowledgements :
This is an independent work and it owes nothing to any person or organisation.

Conflict of Interest :
The author declares no conflicts of interest.

Authors' Contribution :
As the sole author, I made equal and full contribution in the present work.

Funding :
No specific funding was received for this research.

Ethics Statement :
No experiment has been done on humans and animals.

Informed Consent :
Proper consent was taken during collection of data and the privacy rights of the subjects have been respected.

References:

Agarwal, B. (2021). Gender equality, food security and the sustainable development goals. *Current Opinion in Environmental Sustainability, 49*, 26–32. https://doi.org/10.1016/j.cosust.2021.01.002

Banaji, S., & Bhat, R. (2023). *Gender, digital technologies and political participation in South Asia*. Routledge.

Bhatia, A., & Bhabha, J. (2023). Digital citizenship and women's political participation in India. *Information Technologies & International Development, 19*(1), 1–18.

Bimber, B. (2003). *Information and American democracy: Technology in the evolution of political power*. Cambridge University Press.

Binns, M. (2020). Artificial intelligence and gender equity: Addressing bias and promoting inclusivity. *Journal of Technology in Society, 15*(3), 45–59.

Borah, H. (2021). Women and political participation in Assam: Challenges and prospects. *Journal of North East India Studies, 11*(2), 45–58.

Caraway, T. L., & Htun, M. (2020). Gender equality and political participation in developing democracies. *Annual Review of Political Science, 23*, 245–263. https://doi.org/10.1146/annurev-polisci-050718-033630

Couldry, N., & Mejias, U. A. (2019). *The costs of connection: How data is colonizing human life and appropriating it for capitalism*. Stanford University Press.

Criado-Perez, C. (2019). *Invisible women: Data bias in a world designed for men*. Abrams Press.

Election Commission of India. (2022). *Initiatives to promote voter awareness*. Election Commission of India.

Election Commission of India. (2024). *Statistical report on general elections and voter participation*. Election Commission of India.

E-Rozgar Assam. (2021). *Assam government initiatives for women's employment and empowerment*. Government of Assam.

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., Luetge, C., Madelin, R., Pagallo, U., Rossi, F., Schafer, B., Valcke, P., &Vayena, E. (2018). AI4People—An ethical framework for a good AI society: Opportunities, risks, principles, and recommendations. *Minds and Machines, 28*(4), 689–707. https://doi.org/10.1007/s11023-018-9482-5

Government of Assam. (2023). *Annual report on women's empowerment*. Government of Assam.

Government of India, Ministry of Electronics and Information Technology. (2023). *Digital India annual report 2022–23*. https://www.meity.gov.in

Indian Election Commission. (2022). *Initiatives to promote voter awareness*. Election Commission of India.

International Institute for Democracy and Electoral Assistance. (2021). *Women's political*

participation: Global trends and challenges. International IDEA.

International Telecommunication Union. (2023). *Measuring digital development: Facts and figures 2023*. ITU. https://www.itu.int

Kabeer, N. (2016). Gender equality, economic growth, and women's agency: The "endless variety" and "monotonous similarity" of patriarchal constraints. *Feminist Economics, 22*(1), 295–321. https://doi.org/10.1080/13545701.2015.1090009

Krook, M. L., & O'Brien, D. Z. (2012). All the president's men? The appointment of female cabinet ministers worldwide. *The Journal of Politics, 74*(3), 840–855. https://doi.org/10.1017/S0022381612000382

Lutz, C. (2019). Digital inequalities in the age of artificial intelligence and big data. *Human Behavior and Emerging Technologies, 1*(2), 141–148. https://doi.org/10.1002/hbe2.140

Margetts, H. (2017). Political participation online: The changing locus of democracy. *Government and Opposition, 52*(1), 1–25. https://doi.org/10.1017/gov.2016.24

Ministry of Women and Child Development. (2023). *Women and men in India 2023: A statistical compilation of gender-related indicators*. Government of India.

MyGov India. (2021). *AI-driven citizen engagement platform*. Government of India. https://www.mygov.in

NITI Aayog. (2021). *Responsible AI for all: Strategy for India*. Government of India. https://www.niti.gov.in

Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the Internet worldwide*. Cambridge University Press.

Organisation for Economic Co-operation and Development. (2019). *Artificial intelligence in society*. OECD Publishing. https://doi.org/10.1787/eedfee77-en

Organisation for Economic Co-operation and Development. (2023). *The OECD framework for the classification of AI systems*. OECD Publishing. https://www.oecd.org

Rajya Sabha Secretariat. (2023). *Women's representation in Indian politics: Trends and policy challenges*. Parliament of India.

Rheingold, H. (2008). Using participatory media and public voice to encourage civic engagement. In W. L. Bennett (Ed.), *Civic life online: Learning how digital media can engage youth* (pp. 97–118). MIT Press.

Saxena, R., & Sharma, N. (2022). Women in governance and digital transformation in India. *Indian Journal of Public Administration, 68*(4), 589–605.

Sharma, K., & Das, D. (2022). Digital inclusion and women empowerment in North-East India: Opportunities and challenges. *Indian Journal of Gender Studies, 29*(3), 385–404.

Sharma, R. (2021). Digital literacy and political participation: A study in rural India. *Journal of Political Studies, 45*(3), 234–256.

Smith, H., & Larkin, P. (2021). Ethical AI and political decision-making: Challenges and opportunities. *Ethics and Political Technology Journal, 22*(4), 13–24.

UN Women. (2023). *Women's political participation and leadership: Global facts and figures*. UN Women. https://www.unwomen.org

UN Women. (2024). *Progress on the Sustainable Development Goals: The gender snapshot 2024*. UN Women.

United Nations. (2020). *The role of technology in gender equality*. United Nations.

United Nations Development Programme. (2021). *ShePower project: Enhancing women's political participation in India*. UNDP India.

United Nations Development Programme. (2022). *Human development report 2021/2022: Uncertain times, unsettled lives*. UNDP. https://hdr.undp.org

United Nations Development Programme. (2023). *Digital strategy 2022–2025: Empowering people through digital transformation*. UNDP.

United Nations Educational, Scientific and Cultural Organization. (2021). *Artificial intelligence and gender equality: Key findings of UNESCO's global dialogue*. UNESCO Publishing.

United Nations Educational, Scientific and Cultural Organization. (2024). *Guidance for generative AI in education and research*. UNESCO Publishing.

World Bank. (2019). *Bridging the digital divide: A global perspective*. World Bank.

World Bank. (2023). *Women, business and the law 2023*. World Bank. https://wbl.worldbank.org

World Bank. (2024). *Digital progress and trends report 2024*. World Bank.

World Economic Forum. (2023). *Future of jobs report 2023*. World Economic Forum.

World Economic Forum. (2024). *Global gender gap report 2024*. World Economic Forum. https://www.weforum.org

Youngs, G. (2007). *Global political economy in the information age: Power and inequality*. Routledge.

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for a human future at the new frontier of power*. PublicAffairs.

S.S.J.
PDUAMD

Jinti Kalita
Assistant Professor
Department of Education,
PDUAM, Dalgaon
Email:jintikalita59@gmail.com

Adapting to change: Life Skills for Navigating Life Transitions and Mental Health Stability of the adolescence and early adulthood period

Abstract :
This paper aims to explore the crucial role of life skills in navigating life transitions of an adolescent and a young adult whether it is personal, professional or social in reference to maintain mental health stability. Life skills like adaptability, emotional regulation, problem solving etc. always equip an individual to cope with different changes of his or her life. Individuals can maintain balance during the times of changes by developing the life skills and thus they can prevent their mental health crisis. In life, an individual must go through various transitions like career changes, relocation, broken relationships, losing people, aging, becoming a parent etc. All these transitions in life must be dealt with perfectly to maintain our mental health well-being. Developing life skills will help people to translate their knowledge, values and attitudes into healthy behaviour in order to navigate through daily challenges more easily. All life transitions can cause stress, anxiety, uncertainty and sometimes depression. The impacts of these transitions on the mental health of individuals are based on the individuals' ability to adapt to the changing circumstances. Through this exploration the paper emphasizes the importance of life skill education in enhancing both emotional and psychological resilience in dealing with life's inevitable changes.

Keywords: Adapting, Life skills, Navigating, Life transitions, Mental Health, Stability.

Introduction :
In this ever-evolving world, the ability to adapt to change has become a crucial life-skill. All the life-transitions no matter whether it is personal experience such as career shifts, feeling of loss or any other societal changes like economic fluctuation – can impact our mental health and our overall well-being. Not being able to adjust or deal with the changes often leads the young people towards addiction to different narcotic substances, leading to hallucinations and providing an escape from reality. In such circumstances, the importance of equipping oneself with effective life skills cannot be exaggerated.

As per WHO (1997), the life skills are abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life.

UNICEF (2004**)** defines life skills as, 'a behaviour changes or behaviour development approach designed to address a balance of three areas: knowledge, attitude and skills.'

According to CBSE Teacher's Manual for Life Skills Education (2013),'Life skills are essentially those abilities that help to promote mental well-being and competence in young people as they face realities of life. They are generally applied in the context of health and social events.' They are broadly categorized under three categories: - thinking skills, social skills and emotional skills.

As per Singh and Menon (2015**)**, Life skills are a range of psycho-social and cognitive abilities that equip children to make informed decisions and choices, manage their emotional well-being and communicate effectively.

Rao (2016)defines life skills as, 'Life Skills are the abilities which make persons to live a fruitful life.'

Some important life skills such as emotional regulation, problem-solving, resilience, adaptability, self-care, decision-making skills, Self-awareness, Critical thinking skills, Creative thinking skills, Inter-personal skills, Empathy etc. are some of the important tools which can help in navigating the complexities of change. It can empower the individuals not only to cope with the different life challenges but also to thrive amidst all the uncertainties (WHO, 1997).

During various transitions of life, developing mental health stability is a must for maintaining a balanced life. By developing a strong support system, setting realistic goals, practicing self-care, individuals can use all the life transitions as opportunities rather than threats. Embracing life transitions should be considered as an opportunity for growth. There is a high probability that by learning life skills, individuals can enhance their capacities for navigating the life transitions, also, they can improve their mental health stability and overall resilience in the face of adversity.

Objectives:

- To know the status of life skills at adolescence and early adulthood stage.
- To know about the status of mental health.
- To suggest some basic measures to promote life skills among young people.

Methodology:

The paper is based on secondary data only which is collected from various websites, newspapers, journal articles, books etc. All secondary data have been analyzed considering individual's life at adolescence and early adulthood stage as per Erik Erikson's stages of human development (Erikson, E.H ;1950).

Background of the study:

Throughout life, an individual undergoes various transitions which shape his/her personality. Adolescence period is full of significant transitions of every human being (Stanley Hall, 1904). At this stage, puberty brings hormonal changes, physical growth and most importantly it develops the sexual identity for the person. These changes are so hard and confusing to deal with or to navigate. Hall specially emphasized Cognitive and Emotional development in adolescence which make the individual begin to develop self-awareness, abstract thinking and also, they start to have mood swings, heightened sensitivity and struggling with their self-esteem. During adolescence, children want to explore their independence and develop a sense of self. Those who receive proper encouragement and reinforcements through personal exploration will emerge from this stage with a strong sense of self and feelings of independence and control and those who remain unsure of their beliefs anddesires as well as do not receiveencouragement will feel insecure and confused about themselves and about their future Erikson, E. H. (1950).

During early adulthood, young adults need to build deep, loving relationships with others. Success in this stage fosters strong, lasting bonds, while failure can lead to loneliness and isolation. It is a time of exploring and developing personal connections for the young people Erikson, E. H. (1950**)**. Erikson also emphasized the importance of forming close, committed relationships. Those who succeed in this stage create secure and enduring connections that contribute to their emotional well-being.

Observations:

In the present study to know about the present status of life skills at adolescence and early adulthood stage, the researcher has observed some the cases across India:

Case 1 (2019): An IIT Hyderabad student named Anirudhyawho secured 99.7 percentile in CAT, jumped to death from his hostel building on the campus. Just before the incident, he sent an e-mail to one of his friends telling him about his suicidal plan. According to the father of the deceased, the boy was not able to decide on what he wanted to do next. (Feb 3,2019; The Times of India)

Case 2 (2024): Another 21 year old IIT Guwahati student named Bimlesh Kumarfrom UP's Ballia district committed suicide in his hostel room. According to sources, Bimlesh struggled with academic backlogs and financial difficulties, which prevented him from participating in the internship programme. (Sep 10, 2024; Times of India)

Case 3 (2024): Another youth Rathim (23) of Vellarivayal near Anchu Kunnu, Kerala committed suicide. Before committing the crime, he posted a video on Facebook where he said that he was talking to a friend when police saw them and they made it a POCSO case. He also said that even if he proves his innocence in this matter, people will look at him in that way only. (November 4, 2024; The Times of India Kozhikode news)

Case 4 (2024): A 14 year old girl committed suicide prompting manhunt for former partner in Panvel, Mumbai on 29th November,2024. As per reports, the girl who had left school only after completing class 8, was in a relationship with 21 years old. Their family members discovered the affair and raised strong objections for various reasons. Recognizing the gravity of the situation, the boy decided to end the relationship and marry somebody else. Devastated by this development, the 14-year-old took her life in a local playground. (December 3, 2024; Hindustan Times)

Case 5 (2024): Unemployed engineer died by suicide in Noida. In a note the 27 years old said that he was stressed because he was not getting a job and his live-in partner used to taunt him over this. (December 14, 2024; NDTV)

Case 6 (2024): Teen girl died by suicide in UP as she was upset over her close friend's death. Pushpa Devi Prajapati (18 years old) and Gayatri (19 years old) hung themselves at their homes. As per reports, Gayatri was upset after being unable to buy warm cloths and died by suicide at her home. The police were preparing to conduct a post-mortem examination of Gayatri's body when they received another information that her friend Pushpa Devi had alsotaken her own life. The two girls were so close friends that they even tattooed each other's names on their arms. (December 21, 2024; NDTV)

These are only some real-life examples of how the young people who take such serious decisions to their lives even after a minor inconvenience takes place in their lives. In these cases, we can see lack of life skills within the individuals to deal with their day-to-day problems. There are so many individuals who are finding many difficulties to adjust or solving their day-to-day life problems which are leading them even towards substance dependency to avoid reality. Therefore, it is felt that teaching the young generation about different life skills may help to an extent to reduce such incidents.

When we talk about mental health, the growing suicidal rates across the world cannot be unseen. As per WHO more than 7,00,000 people die by suicide every year, which is one person every 40 seconds. The latest WHO assessment of deaths by cause is for the years 2000-2019 where suicide was accounted for 1.3% of all deaths worldwide, making it the 17th leading cause of death in 2019, in fact 77% of suicides occurred in low- and middle-income countries.

As per World health statistics 2024: monitoring health for the SDG's, Sustainable Development Goals, Globally, the rate of suicide deaths for men was more than double that for women in 2021. Suicide is also a major national public health issue even in the developed countries like United States. In 2023, the suicidal rate increased to over 14.7 per 100,000 persons in U.S.

According to NCRB's (National Crime Records Bureau) report for Accidental Deaths and Suicides in India 2022, A total of 1,70,924 suicides was reported in the country during 2022. State/UT wise Percentage Share of Suicides in States/UTs during 2022 are as follows:

Andhra Pradesh 5.2%, Chhattisgarh 4.9%, Uttar Pradesh 4.8%, Maharashtra 13.3%, Tamil Nadu11.6%, Madhya Pradesh 9.0%, Karnataka 8.0%, West Bengal 7.4%, Kerala 5.9%, Telangana 5.8%, Gujrat 5.3% and others 18.8%. (Note: Other States/UTs include Arunachal Pradesh, Assam, Bihar, Goa, Haryana, Himachal Pradesh, Jharkhand, Manipur, Mizoram, Nagaland, Meghalaya, Odisha, Punjab, Rajasthan, Sikkim, Tripura, Uttarakhand, A & N Island, Chandigarh, D & N Haveli & Daman & Diu, Jammu & Kashmir UT, Delhi, Ladakh, Lakshadweep and Puducherry).

The causes of suicides shared by the states/UT as per NCRB's (National Crime Records Bureau) report for Accidental Deaths and Suicides in India 2022 are as follows:

Family Problems 31.7%, Illness 18.4%, Drug Abuse/ Alcoholic Addiction 6.8%, Marriage Related Issues 4.8%, Love affairs 4.5%, Bankruptcy or Indebtedness 4.1%, Unemployment 1.9%, Failure in Examination 1.2%, Death of Dear Person 1.2%, Professional/Career Problem 1.2%, Property Dispute 1.1%, Poverty 0.8%, Fall in Social Reputation 0.5%, Suspected/Illicit

Relation 0.5%, Impotency/Infertility 0.2%, Causes not known 10.4% and other causes 10.7%. Figure of Suicides due to ideological causes/hero worshiping, physical abuse and illegitimate pregnancy included in Other Causes.

Interpretation of the study:

- In the two cases of the IIT students that we have observed, it may be interpreted as even if the students from IIT Hyderabad and IIT Guwahati were academically so high, but they may be lacking in the life skills to handle whatever stress they were going through. Skills like decision-making, communicating with others, problem-solving skills, skill of stress management, negotiation etcseem to be lacking in them.
- In the cases of the teen girls, it is observed that the girls could not accept the loss of their loved ones

and found it very difficult to accept and adjust to the realities. First of all, if minor girls like them were taught to properly communicate with others or even about being emotionally intelligent, the incidents may be forbidden from happening. Problems like not having warm clothes are common in a developing country like India. But instead of fighting for it or communicating to the different public services or NGOs, deciding to end one's life should not happen. That is where we need the skill to make right decisions and the skill to lead. By creating awareness about these life skills, all these innocent souls may be protected from taking such harsh decisions to themselves.

- In the case of the unemployed engineer of Noida, it seemed that his confidence totally vanished by his partner regarding his employment and self-esteem. But misfortune could be prohibited if he took the right decisions at right time. Most of the time, it seemed that people often worry about adapting to new circumstances and try to stick to the current circumstance which in turn drives the individual towards self-destruction just like what happened in this case.

- And in the last case of 23-year-old Rathim from Kerala, the fear of being judged by other people led him to take his own life. It is a misfortune that a young boy like him had to face such incident, but who exactly was responsible for this incident was himself. For the hesitation to face reality or the fear of not being able to prove himself right in that matter, he took his own life instead of fighting for it. If he could fight for his self-esteem, he could take the proper decision and be able to live with dignity in society again after standing for the right.

- In a recent study it was found that the prevalence of substance use was 32.8%, with a median substance initiation age of 18 years and among the substance users, 75.5% began before completing adolescence (Venkatesh U et al.,2024). It was concluded by the study that high substance use prevalence among young people in Indian healthcare centres underscores the urgency of targeted intervention.

- All these incidents highly signify the status of life skills among the adolescents and individuals at early adulthood stage is not satisfactory. It is evident that not being aware of life skills can do a lot of harm to us. Having the life skills can protect every individual from any misfortune which will in turn allow us to maintain our mental health stability.

The life skills like communicating with others, problem solving skills, time management skills, skill of emotional intelligence, adaptability, financial literacy, decision-making skill, skill of self-care, inter-personal skills, skills to lead, skill of stress management, creativity, negotiation, skill of conflict resolution, skill of networking etc. should be addressed and developed among the youths.

At this stage, the main concern of the individuals is to establish independence. Starting a career, moving out of the parental homes, managing their own finances, making decisions to marry or forming long-term relationships, establishment of their own identities etc. are so stressful as it needs new levels of trust and commitment. Not being able to adjust to these changes may often lead young people towards substance dependency.

In this modern competitive era, young people are often found to be stressed about various aspects of their lives where social media plays a great role both positively and negatively.

Thus, it may be interpreted as all these aspects should be considered for a scientific study for proper conclusive remark.

Suggestions:

Developing life skills among the youth is a collaborative effort involving the Educators, Parents, Mentors and Youth Leaders.

- Youths should be involved in community services to develop their ethics, kindness and social responsibilities. This will give meaning to their lives, reducing the feelings of emptiness.

- They should be involved in the practice of active listening and respectful expressions of their thoughts.

- They should be taught to set realistic goals.

- They should be taught to find multiple solutions to a problem.

- They should be encouraged to seek solutions proactively.

- They should be encouraged to view mistakes as learning opportunities rather than personal failures.

- They should be taught to evaluate their thoughts and to challenge their negative thoughts.

- There should be the promotion of empathy so that they can support their friends and recognize signs of distress in others.

- The young people should be educated on helplines and support resources for mental health crisis.

- People should be taught that no situation is permanent and better days are always ahead.

Conclusion:

Following the importance of life skills NEP 2020 has provided the students with opportunities to study life skill education as a part of their Skill Enhancement Course which will ultimately help them to adjust in their changing circumstances and to solve their everyday problems. By cultivation these life skills we can align with the goals of NEP 2020which is aiming to provide a holistic, multidisciplinary and future-ready education. Project based learning, Interdisciplinary lessons, Encouraging Open Communication, Teachers' exemplifying behaviour, Group activities, Peer teaching, Creative Assignments, Service to the community etc. are some of the methods through which we can inculcate life skills in students apart from proving them theoretical knowledge about the same.

All the life transitions – major or minor, expected or unexpected – make our lives memorable ones. We receive many valuable lessons during all the transitions which shape our identity, make us responsible for our family and society itself and develop our personalities. Learning life skills will help a lot to deal with all the life transitions more effectively and equip us with all the capacities to maintain our mental health stability.

Acknowledgements :

This is an independent work and it owes nothing to any person or organisation.

Conflict of Interest :

The author declares no conflicts of interest.

Authors' Contribution :

As the sole author, I made equal and full contribution in the present work.

Funding :

No specific funding was received for this research.

Ethics Statement :

No experiment has been done on humans and animals.

Informed Consent :

Proper consent was taken during collection of data and the privacy rights of the subjects have been respected.

References:

Ahmadi Gatab, T., Shayan, N., Tazangic, R. M., &Taherid, M. (2011). Students' life quality prediction based on life skills. *Procedia – Social and Behavioral Sciences, 30*, 1980–1982. Retrieved from https://www.sciencedirect.com/science/article/pii/S1877042811022099

Arnett, J. J. (2014). *Emerging adulthood: The winding road from the late teens through the twenties* (2nd ed.). Oxford University Press.

Baltaci, H. S. (2013). Turkish 6th–8th grade students' social emotional learning skills and life satisfaction. *International Journal on New Trends in Education and Their Implications, 4*(2), 1–14.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company.

Bertolote, J. (2008). The roots of the concept of mental health. *World Psychiatry, 7*(2), 113–116. https://doi.org/10.1002/j.2051-5545.2008.tb00172.x

Bhatia, B. D. (1982). *Mental health in education*. Sterling Publishers Pvt. Ltd.

Blair, S. (2000). The centrality of occupation during life transitions. *British Journal of Occupational Therapy, 63*(5), 231–237.

Bolat, Y., & Korkmaz, C. (2021). Social values and life skills as predictors of organizational culture: A study on teachers. *SAGE Open, 11*(2), 1–17.

Brown, B. (2010). *The gifts of imperfection: Let go of who you think you're supposed to be and embrace who you are*. Hazelden Publishing.

Corey, G. (2017). *Theory and practice of counseling and psychotherapy* (10th ed.). Cengage Learning.

Devvarta Kumar, M., & Kishore, T. (2017). *Living life positively: A facilitator's manual for conducting workshops in the domain of life-skills education, stress management and sensitization program for suicide prevention*. Directorate General of Health Services, Government of India.

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Eccles, J. S., & Gootman, J. A. (Eds.). (2002). *Community programs to promote youth development*. National Academy Press.

Erikson, E. H. (1968). *Identity: Youth and crisis*. W. W. Norton & Company.

Gharamaleki, N. S., & Rajabi, S. (2010). Efficacy of life skills training on increase of mental health and self-esteem of the students. *Procedia Social and Behavioral Sciences, 5*, 1818–1822. https://doi.org/10.1016/j.sbspro.2010.07.370

Gillham, J. E. (Ed.). (2000). *The science of optimism and hope: Research essays in honor of Martin E. P. Seligman*. Templeton Foundation Press.

Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ*. Bantam Books.

Government of India. (2020). *National Education Policy 2020*. Ministry of Education. Retrieved from https://www.education.gov.in

Hodge, K., Danish, S., & Martin, J. (2013). Developing a conceptual framework for life skills interventions. *The Counseling Psychologist, 41*(8), 1125–1152.

Keyes, C. L. M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior, 43*(2), 207–222. https://doi.org/10.2307/3090197

Masten, A. S. (2014). *Ordinary magic: Resilience in development*. Guilford Press.

Myers, D. G., & Diener, E. (1995). Who is happy? *Psychological Science, 6*(1), 10–19. https://doi.org/10.1111/j.1467-9280.1995.tb00298.x

Parker, J. D. A., Summerfeldt, L. J., Hogan, M. J., & Majeski, S. A. (2004). Emotional intelligence and academic success: Examining the transition from high school to university. *Personality and Individual Differences, 36*(1), 163–172. https://doi.org/10.1016/S0191-8869(03)00076-1

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069–1081. https://doi.org/10.1037/0022-3514.57.6.1069

Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Free Press.

Sharma, R. R. (2003). *Enhancing adolescent life skills*. Sage Publications India.

Singh, A. K., & Gupta, N. (2015). Life skills education and mental health among adolescents: A review. *Indian Journal of Health and Wellbeing, 6*(4), 396–399.

UNICEF. (2012). *Global evaluation of life skills education programmes*. United Nations Children's Fund.

World Health Organization. (1997). *Life skills education for children and adolescents in schools*. World Health Organization.

World Health Organization. (2004). *Promoting mental health: Concepts, emerging evidence, practice*. World Health Organization.

World Health Organization. (2022). *World mental health report: Transforming mental health for all*. World Health Organization.

Yalom, I. D. (2005). *The theory and practice of group psychotherapy* (5th ed.). Basic Books.

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary Educational Psychology, 25*(1), 82–91. https://doi.org/10.1006/ceps.1999.1016

S.S.J.
PDUAMD

Lalpiengmawi Changsan[1]
Dr. D.L, Haokip[2]
[1]Research Scholar, Department of History
Gauhati University
Email : Changsanpiengmawi2014@gmail.com

[2]Associate Professor, Department of History
Gauhati University
Email: jphaokip@gmail.com

Corresponding Author
Lalpiengmawi Changsan
Email : Changsanpiengmawi2014@gmail.com

Historical Insights into the Traditional Governance system of the Kukis of Dima Hasao

Abstract :
The Kukis, scattered over the Northeast frontier regions, are people of rich traditional heritage. The political structure of the Kukis is based on kinship and hierarchical order of the clan. This study will analyze the structure and functioning of traditional political institutions among the Kukis with focus to Dima Hasao District, Assam. The paper based on primary and secondary sources will study the authority of the village Chief (*Haosa)* and the functioning of the village council in traditional governance. The Kuki governance system was largely decentralized, with each village functioning as an independent political unit under hereditary leadership. The study aims to contribute to a better understanding of traditional political institutions.

Key words: Kuki, Chieftainship, Traditional political institutions, Village governance, Dima Hasao.

Introduction :
The entire Northeastern region is inhabited by various groups of people belonging to different tribes, sub-tribes and clans. The present-day Kukis reside in the district of Dima Hasao, Assam as well as in states like Meghalaya, Mizoram, Nagaland, Tripura and Manipur. However, since the area of study focuses on the Kukis of Dima Hasao. It will try to limit its study within this region only. Dima Hasao is one of the two hill districts of present Assam enjoying the status of Autonomous District under the provision of Sixth schedule of the constitution of India. The district with a total area of 4888 sq.km out of the total area of 78,438 square kilometers of the State. Dima Hasao is a land of cultural diversity, which is populated by various ethnic communities and races like the *Dimasas, Jeme Nagas, Hmars, Kukis, Biates, Hrangkhols, Khasis, Lushais, Karbis, Vaiphei* and the *Khelmas*who maintain their own dialect, culture, customs and traditions. Apart from various ethnic communities, non-tribals like Bengali, Nepali, Assamese, Punjabi, Bihari and some other Hindi speaking people also account for a sizeable amount of population. The headquarters, Haflong, is situated at an altitude of 966 meters or 3188 feet, which renders the climate rather pleasant with cool summers. The temperature ranges and the altitudes make Haflong the only proper 'Hill Station' of Assam. The tallest peaks of the Barail Range are located in the districts which are *Thumjang* and Hempeupet standing at 1866 meters and 1748 meters above sea level respectively. The Kuki society's traditional institutions were multi-faceted, covering political, economic, social and religious, that were integral to their life and culture. This paper emphasizes on the political institution which is intrinsic to the traditional life of the kukis.

Objectives of research:
1. To analyze the structure of traditional political institutions among the Kukis.
2. To examine the role and authority of the village chief in traditional society.
3. To assess the role and functioning of different administrative system in traditional society.

Methodology:
The study is based on empirical and descriptive study with historical approach, mainly on primary sources and secondary data. The study involves different methodology for data collection and interpretation.

Research methods such as semi structured interview with Village Chiefs and community Elder carried out. Oral narratives prove crucial to such a reconstruction due to dearth of written records, recorded files and other documents. Apart from these, historical analysis method will be used accompanied by critical analysis of available secondary sources both in English and vernacular languages related to the topic.

Review of Literature

The review of literature for the present study focuses on books, journals, reports, and scholarly writings related to power structure, tribal governance, Kuki society, constitutional provisions, tradition, and contemporary socio-political transformations. Existing literature reveals that the Kuki political system is deeply rooted in hereditary chieftainship, customary practices, and collective socio-cultural values. Several colonial and historical writers also provide valuable information on the origin, migration, and settlement of the Kukis. However, a contemporary study shows the gradual transformation of these institutions under the influence of colonialism, modernization and Christianity.

One of the earliest colonial writings discussing about the Kukis of North Cachar Hills is depicted in the works of Alexander Mackenzie's The Northeast Frontier of India (1884). His work is important for the study of the Kukis because it provides detailed descriptions of their social organization, village administration, warfare, migration, raids, and political relations with the British colonial government. Mackenzie viewed the Kukis as powerful hill tribes inhabiting the regions of Cachar, Manipur, Lushai Hills, and the NorthCachar Hills. He discussed the independent nature of Kuki villages and highlighted the authority exercised by hereditary chiefs over their subjects. Despite its importance, the work has certain limitations. Since Mackenzie wrote from the viewpoint of a colonial administrator, tribal societies were often described as "primitive," "savage," or "lawless." The narrative largely justifies British intervention and portrays colonial rule as necessary for maintaining order on the frontier. Consequently, the voices and perspectives of the tribal communities themselves are largely absent.

Another important work on traditional Kuki governance is William Shaw's Notes on Thadou Kukis (1929). He provided detailed accounts of the hereditary institution of chieftainship among the Kukis. According to him, the village chief occupied the highest position in the village administration and exercised judicial, administrative, military, and economic authority. The chief was regarded as the custodian of customs and traditions and enjoyed privileges such as taxation, free labour, and control over village land. Shaw also highlighted the loyalty of villagers towards the chief and described the Chief as the centre of social and political organization in Kuki society. His work remains one of the foundational sources for understanding traditional Kuki governance.

S. Barkataki'sThe Tribes of Assam (1969) offers a broad account of various tribes of Assam, including the Kukis. The work provides information regarding their settlement patterns and socio-cultural characteristics. Since the book covers numerous tribes within a limited volume, it has certain limitations, the discussion on individual tribes, including the Kukis, remains brief and descriptive rather than analytical. The author mainly focuses on socio-cultural aspects and gives comparatively less attention to political transformations, colonial impact, constitutional changes, and contemporary governance system.

Tarun Goswami's Kuki Life and Lore (1985) is one of the earliest systematic studies on the Kukis of Dima Hasao. The book provides detailed information regarding Kuki customs, traditions, socio-economic life, and village administration. However, the work mainly concentrates on traditional aspects and pays limited attention to contemporary political transformations. The present study therefore attempts to bridge this gap by analyzing both traditional and contemporary power structures.

T.S. Gangte's The Kukis of Manipur (1993) is one of the most comprehensive works on Kuki political and social organization. Gangte analyses the hierarchy of Kuki chieftainship, the powers and obligations of chiefs, village administration, and customary laws. He rejects the characterization of Kuki chiefs as despotic rulers and instead describes them as custodians of custom and tradition. According to Gangte, the Kuki chief was not merely a ruler but also the guardian of tradition and community welfare His work provides a strong basis for understanding the legitimacy and functioning of traditional Kuki authority. This work is particularly useful for understanding the functional and moral basis of Kuki chieftainship.

P.S. Haokip's Zalen Gam (1998) discusses the origin, migration, and historical background of the Kukis. The book serves as an important historical source for understanding the settlement and evolution of Kuki society. Also, Sipra Sen's Tribes and Caste of Assam: Anthropology and Sociology (1999) focus on tribal administration and the implementation of the Sixth Schedule in North Cachar Hills and Karbi Anglong. The work also acknowledges the continued existence of chieftainship in hill tribal societies.

Dr. Thangkim Haolai's Kuki Culture in North Cachar Hills (2006) studies the transformation of Kuki

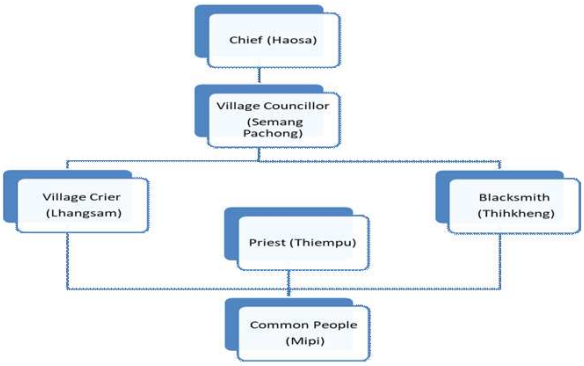
religious life from animism to Christianity. The writer highlights how Christianity influenced cultural values, social organization, and community life among the Kukis. This study is relevant because religion has emerged as an important force in contemporary Kuki power structures.

According to S. Seikholet Baite, in his article Chieftainship and Democratic Governance: Pattern and Relationship (2024) discuss how traditional Kuki chieftainship functions alongside democratic institutions. The study identifies two forms of chieftainship: traditional chieftainship, where the chief exercised complete authority over land and administration, and modern chieftainship, where authority has become more participatory and influenced by democratic values. Baite argues that modernization and democratic governance have compelled Kuki chieftainship to adapt to contemporary social realities.

Overall, the review of literature reveals that the traditional governance system of the Kukis is centered on hereditary chieftainship, customary laws, collective administration, and community welfare. Existing studies provide substantial information regarding village administration, authority of chiefs, land relations, and customary justice. The literature further reveals that Christianity and modernization have largely influenced Kuki governance. Traditional religious authority and customary rituals gradually declined after the spread of Christianity. However, there remains a gap in the literature concerning the interaction between traditional governance and contemporary democratic institutions, especially in relation to accountability, participation, gender inclusion, and constitutional governance. Therefore, further research on the continuity and transformation of Kuki traditional governance systems remains highly significant for understanding tribal politics and indigenous institutions in Northeast India. Therefore, the present study seeks to fill this research gap by examining the continuity, transformation, and co-existence of traditional and contemporary power structures among the Kukis of Dima Hasao district.

Discussion

The political structure of the *Kukis* is based on kinship and hierarchical order of the clan. According to clan lineages, there will be hierarchical lines from the eldest clans to the youngest ones. A village is an independent political unit among the *Kukis*, and the chief of the village and his council of ministers are the political leaders. The administration of Justice, enforcement of executive responsibilities, maintenance of social practices and customary law (including religious performances) are the areas of the village administration under the Chieftainship and his Council of Ministers. *Kuki* Polity is centered on Chieftainship. Chieftainship among the *Kukis* is associated with the *'Upa'* or senior man or eldest in the family. '*Upa*' is the only person who can become the Chief and the '*Naopa'* or the younger ones cannot, in the normal course of the customary law, becomes the chief. The chart below illustrates the Political Institution or village administrative system of the Kukis in their traditional society.



Traditional Village Chief (Haosa) : The *Haosa* (Chief) is the custodian of the village land; he owns the land for the whole village. However, villagers can also use the land for cultivation and other purposes with permission of the Chief and his Council of Ministers. The Chief enjoys the sole authority upon the land of the village. No female in the family is allowed to succeed as heir. Therefore, even if a situation arises that the eldest son happens to be found unfit for the position, the office will go to the next eldest son. The *Haosa* (Chieftainship) system became a perpetual foundation of law which depends on the appropriate useof the custom and traditions.

Powers and Functions of Haosa: With regard to the power of the Kuki *Haosa* residing in Dima Hasao of Assam, several writers have noted that the Kuki Chief enjoyed enormous power. The Chief or *Haosa* symbolizes wealth, power and affluence. The Chief is empowered with judicial power. His decisions are considered final and his command in any case is regarded as law. The Chief owned the entire land of the village and in the case of migration, it was customary to approach the chief and seek his permission. In this regard, the intending person has to offer a jar of wine to the Chief. In the present context, offering of wine has been stopped with the conversion of the Kukis into Christianity and it has been replaced by tea.

In the light of the above, it may be noted that as told by Pu L. Guite, Chief of Songpijang Village, 'The villagers now possess land registered under their name so the strict rule of migration could no longer be applied anymore'but again as stated by Pu. S. Hengna, Ex-

Chief of P.Leikul village, 'the villagers seek permission of the Chief in case of migration to other village or willing to migrate in the village. All the land remains exclusively under the chief.'

Another important feature of the Chief was that he holds the power to make the prisoners his slaves. If a fugitive or an outcaste took refuge in the Chief's house, he pledges himself as a vassal or Slave of his protector. Again, his house was regarded as a place for shelter. An orphan or a widow or any person who has no means to support oneself was received there and they would get food and shelter in return for working for the Chief.

Another important function of the Chief was in welcoming visitors and even providing them with food and accommodation during their stay in the village. It was customary practice that whoever visited the village should pay a courtesy call on the Chief and apprised him of the purpose of his visit. As the guardian of the village, he defended and protected them from any kind of aggression. The Chief makes alliance with the Chief of another village in order to counter the village Chief who used to work against his interest. The Chief attitude towards his people was paternalistic in nature. He helped in need, punished the guilty and rewarded those who achieved something noteworthy. Naturally, strong brave and intelligent Chiefs used to become more powerful. All the political, military and judicial power was vested in the Chief and his Councilors. It was the Chief who appointed all the top officials of the village like the Village Councilors, the Priest, the Blacksmith and the Village Messenger.

Privilege of *Haosa (*Chief)**:** In the traditional Kuki society, the Chief was entitled to receive customary tithes from the villagers in recognition to the Chief's authority and legitimacy over the land ownership, and finally as a mark of respect. The following are some of the rights and privileges enjoyed by the Chief:

Changseo (*Chang* - rice, *Seo* – owe of allegiance): Every household of the village is required to contribute a basketful of paddy to the Chief at the time of harvesting. This attribute is called 'Changseo'. This is a kind of annual payment to the chief.

Samal (*Sa*-animal, *Mal*-leg): Every hunter offers as tax, a hind-leg of every wild animal killed either in hunting or trapping, which means '*Samal*.' This payment is made as a token of privilege to Chief for giving the opportunity to hunt in the jungle of the village.

Salu (*Sa*-Animal, *Lu*- Head) : The Chief is given the head of animal as a token in acknowledgement being the head of village and preserver of wellbeing of the villagers. The head of the animal is partake by the Chief in the company of all the village elders, and its skull is thereafter kept hanging on the front wall of the Chief's house.

Jineiman (*Jinei*-marriage, *Man*-price): In *Chongmou* and *Sahapsat* form of marriage, a female pig is given to the chief as a marriage tax called *Nunghahthengkai* by the bridegrooms's family.

Selkotkai (*Sel*-Mithun *kot*-Cattle, *Kai*-Tax): This is a tax imposed on the buyer of a *Mithun*. The Chief allots a particular plot of land for confining the *Mithun.* When a *Mithun* is sold the buyer has to give a jarful of wine to the Chief at the moment he brings out the *Mithun* through the gate of the enclosure. This payment is called *Selkotkai.*

Selgampotman(*Sel*-Mithun, *Gampotman*- Sale tax): It is a kind of tax imposed by the Chief by way of compensation from the owner of *Sel* or *Mithun* after it is sold as the land where animal is enclosed belong to him. The grass within is eaten up by the animals. Even the soil becomes unfit for any other use. In this case, a tax is collected which is called '*Selgampotman*'. In course of time, a rupee becomes payable in lieu of the jar or wine.

Khotha (*Kho*-Village, *Tha*-labour): It is a customary and compulsory for the villagers to send one person per family on a fixed date once in a year to render help to the Chief in cultivation or whenever it becomes necessary to repair or to build a house for the Chief, the villagers are required to do the job. This system is called '*Khotha*'.

Chaoman (*Chao* - migrate, *Man* - Price): Any villager who intended to migrate to another village had to seek the permission of the Chief without which his properties including his house may either be confiscated or retained by the Chief.

Lam kai (Export Tax): Payment of Re. 1 by the purchaser of each head of cattle when the purchaser belongs to another village. A jar of wine could be offered to the Chief to substitute the monetary payment of taxes.

Gam san (*Gam* - Land, *San* - Lease): It is a payment connected to the Chief for the lease of land

Tolthieh(*Tol* - Ground, *Thieh*– Cleaning): The Chief imposed a fine on one or more persons for committing a serious crime like murders, homicide etc. along with a jar of rice beer, a pig could be killed at the Chief's house to bring forth a compromise.

Khomuol (*Kho*- Village, *Muol*- Outskirt): It was a resting place constructed by the villagers at the outskirt or near the entrance of the village. It is important because it was used for all political, religious and social

occasions. It was used for keeping the head of enemies killed. It was also a place for performing all sorts of rites like *kithoi*(appeasement of evil spirit) by the *Thempu* (priest). It was also used for welcoming the people coming to the village and seeing off the outgoing guests as well.

Khuojeh / Umnit /Sahnit: In the traditional kukisociety, these are all associated with social taboos. *Khuojeh* is a preventive measure to fight against the outbreak of epidemics in or around the neighbouringvillages. Whereas *Umnit*or *Sahnit* means forbidden or prohibited. The Chief ordered the villagers to be confined within their home on a particular day. In this connection, Gangte mentioned that the Chief announces the date and villagers remain confined to their homes in events such as occurrence of unnatural death.

Limitations on the Chief's Power: The Kuki Chief with his hereditary rights had great power. But if the Chief act in a cruel manner his common villager chose to shift in another village under benevolent Chief who welcomed them with open arms .This tradition served as a check on unscrupulous chiefs. The Chief is also unlikely to ignore the suggestions offered by his counselors. In fact, the status of the Chief depends on the effective co-operation of his counselors who often play the role of able advisers. The defeated Chief had to pay different kinds of taxes to the former in recognition of his superiority.

***Semang Pachong* (Council of Elders):** In a Kuki village which comprises of many clans, the head of the clan normally becomes the Chief. The Chief therefore selects two village elders called '*Semang Pachong'* to be his helpers or councilors. The *Semang Pachongs* are not hereditary but selected from among the villagers who have vast knowledge in Kuki customs. Infact, the government of the villages had democratic elements. As the village administration is executed on the advice of *Semang Pachong*, the head of the animal killed by a hunter is cooked and eaten by the Council of Elders of the village symbolizing their participation in the administration of the village. Thus, for instance if there was a case involving the Chief's own relatives, he would usually leave it for the elders to decide without being involved in the judgement. So, by demonstrating fairness in the way they formed their judgments, the Chief and the elders normally faced no opposition to their decisions. However, this expulsion is never carried out without the knowledge and consent of the village *Semang Pachong*. The Council members assemble and take decisions. They remain in the office as long as *Haosa* is pleased. All social, political, economic, and judicial matters are dealt with by the council. According to Pu. Lenkai Hengna, *Semang Pachong*of P. Leikul Village, the Chief selects members of his administration. The Chief decides the number of councilor to be appointed'.The *Semang Pachong* or the village councilors are the integral part in the governance of the Kuki village. Further, he stated that the primary functions of the councilors are to assist the Chief in performing his duty. *Semang Pachong*help the Chief in the selection of the site of *Jhum* cultivation.

Another important function of *Semang Pachongs* or councillors is to assist the Chief in all important matters related to village. Usually the Chief never accept or ignored any kind of proposal brought to him by the emissaries from other villages before consulting his councillors. In receiving proposal, he summons his own councillors to discuss the matter. Sometimes the Councillors could overrule the Chief's proposal if they had better proposal to offer. The Chief used to feel it obligatory to entertain such proposalsof the councillors. In the event of the Chief's visit to another village for any political matter or for any personal reasons, one or more councillors of his village accompanied him. In fact, while discharging his functions, the village Chief usually consulted his councillors so that the villagers did not show any kind of resentment over his decision.

Thiempu (Priest): The word *'Thiempu'* means a person who possesses intelligence. He served the village as healer and official priest. He is the councilor-in-charge of public health. His primary role in the village administration relates to religious ceremonies. He is associated with all kinds of public health issues. Also, whenever the village administrators fail to come up with a satisfactory judgement on particular problem, the matter was transferred to the priest. *Thiempu* was highly looked upon as they are considered to be the agent of the Supreme Being on earth. As such, the Chief would also invalidate his verdict if disapproved by the priest. The priest usually chooses his sons and grandsons to impart the secrets of the words. Also, there was hardly anyone who had interest to imbibe this knowledge as it cost lots of money and time. In a traditional Kuki society, *Thiempu* enjoys a respectable position and priviledge. He takes precedence over *Haosa,* because on every occasion he was served *ju* (wine) in order of social position and seniority in age. In the case of *Thiempu*, irrespective of the fact that he is junior or senior or lower status, the Thiempu was first served wine on social and religious occasions. In traditional Kuki society, the role of *Thiempu* is very important. He performed oath. He administers an oath to solve complicated cases in the presence of the Chief and his councilors. He performed different oaths such as Biting tiger's tooth (*Humha pe*), Drinking of the juice of Ai (Aitui don), Diving (*Tuilut*), Eating the earth of a newly made grave *(Leisai bah*), Biting spear or

dao (hemham pe): Drinking water from the barrel of a gun (*Thallong a tuidon*).

***Lhangsam* (Village Crier or messenger):** Another important official in the village council was the *lhangsam* (the herald). He is appointed by the chief. Usually the village crier or the herald is selected from the minority groups or clan in the village. The '*Lhangsam*' remains intact with the Chief most of the time. *Lhangsam* is responsible for the following duties and obligations such as publicrelation, publicity and external affairs. He summoned meeting when asked by the village cabinet members through the advice of the Chief. He is responsible to inform all important decisions and announcementsmade by the chief and his *Semang Pachong* (councilors) according to his convenience. The herald, like the '*Thempu*', is also exempted from payment of tributes to the Chief. Like any other council member, the herald also enjoys certain privileges such as possession of *jhum* land and other privileges enjoyed by the *Upas.* Most of the time, the Village Crier used to be at the Chief's house to keep in touch with him and the councilors. He used to collect the fines imposed by the Chief's council on the errand villagers. On the other hand, so far as his position in the village power structure was concerned the Village Crier used to act as a coordinator between the councilors and the village. In the case of councillors there was no fixed term of office and the same is applied for the Village Crier too. In fact, the Village Crier used to remain in the office as long as he enjoys the favor of the Chief. In this way he occupied one of the important places in the village administration.

***Thihkheng* (Village Blacksmith):** Agriculture was the main occupation for the Kukis. So, the blacksmith offered a significant role in their society. It was observed that in a village where there was a *Thihkheng* (blacksmith) clan; from that clan the Chief used to appoint a village blacksmith. All the villagers employed him to repair their tools and pay for a basket full of paddy after the harvest. He was exempted from paying *Chang-seu* to the Chief and also exempted from forced labor. The traditional Kuki villages have usually two kinds of blacksmith. One is the public blacksmith who make the apparatus related to ploughing and *jhum* cultivation. On the other hand, a private blacksmith is unofficial but his role in the village is equally significant as that of the public blacksmith. The main function of the village blacksmith was to make weapons and agricultural implements. The duties of the blacksmith were to repair various agricultural implements for the villagers. Some of the implements made by the village blacksmith were *Chem* (Dao), *Heicha* (Axe), *Tucha* (Hoe), *Koite* (Sickle), *Tupheng* (Spade) and *Chemcha* (Knife) etc. He does not charge for what he does to the villagers. Everything is done free of cost. In return, he enjoys,baskets full of paddy annually for rendering service to the villagers. He is also exempted from payment of taxes and tribute to the chief. Just as '*Themsa'* is given to the *Thiempu*, '*.Thih-sa'* (meat share for the Blacksmith) is also given to the *Thih-kheng*by the hunters. This is a symbolic payment to the '*Thih-kheng'* for having manufactured the weapons for the hunters.

In traditional Kuki society, the offices of *Thempu*and*Thih-khengpa* were highly desired and sought after positions. The people who hold this respective profession were highly expert and impossible for ordinary villagers. They were highly respected and given special privileges in society.

Conclusion

In traditional Kuki society, the system of Chieftainship serves as the reason behind the preservation and culture continuity. The institution of Chieftainship is deeply rooted in their social structure and serves as the basis of their polity. The fundamental character of the institution of chieftainship is clearly mentioned in the writings of Carey and Tuck that, 'The Chief may be wanting in qualifications and there may be many of other families superior in ability but unless he is physically or mentally unfit for the position, there is no danger of him being removed and the usual course is for elders and advisers to assist him in his rule'. It is to be noted that, in spite of various changes and emerging new forces brought by modern civilization, the institution remain deeply rooted and withstood the test of time. Nevertheless, among the Kuki society, many of their age-old tradition and cultural practices disappeared but they continued in different modified forms in conformity with the Christian principles and ethics. In fact, the institution of *Haosa* or Chief was sustained and utilized by the British as a part of their administrative machinery to serve the interest of the state in general and the tribe in particular. It was also retained as a part of administrative empowerment.

Acknowledgements:

The authors express their gratitude to colleagues and well-wishers for their valuable discussions and moral support during the preparation of this manuscript.

Conflict of Interest:

The authors declare no conflicts of interest.

Authors' Contribution:

Both authors contributed equally to the conceptualisation, data analysis, interpretation, and writing of this manuscript.

Funding:

No specific funding was received for this research.

Ethics Statement:
No experiment has been done on humans and animals.

Informed Consent:
Proper consent was taken during collection of data, and the privacy rights of the subjects have been respected.

References:

Primary Sources: Interview

Interview with Pu. Lamkai Guite, 52yrs, Chief of Songpijang Village, Haflong, Dima Hasao on 10.07.2024

Interview with Pu.Lenkai Hengna, 65yrs ,P.leikul village under Mahur, Dima Hasao on 10.10.2024

Secondary Sources:

Baite, S Seikholet.(2024). Chieftainship and Democratic Governance: Pattern and Relationship. *Educational Administration: Theory and Practice*, *30*(1), 4080–4085.

Barkataki, S. (1969). The Tribes of Assam, National book Trust, India.

Bordoloi, B. N., & Sarma, G. C. T. (1988). Tribes of Assam (Part II), Tribal Research Institute, Assam, Guwahati-781028.

Carey, B. S., & Tuck, H. N. (1976). The Chin Hills: A history of the people, our dealings with them, their customs and manners, and a gazetteer of their country (Vols. 1–2). Firma KLM on behalf of Tribal Research Institute.pp.200-201

Chatterjee, N. (1971). The Mizo Chief and his administration, Tribal Research Institute,Aizawl.

Chongloi,Haoginlen.(2020).History,Identity and Polity of the Kukis,published by Hornbill Press,Imphal.

Gangte, T. S. (1993). The Kukis of Manipur: A historical analysis, Gyan Publishing House, New Delhi.

Gangte, T.S. (1998).Effects of the World Wars to the Kuki Chieftainship, Quoted in a seminar on Resurgence and Reformation organized by Kuki Students Organization, held at Moreh ,Dec 9-12,1998.

Goswami, T. (1985). Introduction to Kuki life and lore, North Cachar Hills District Council, Assam.

Haokip, G. T. (2017a). Kuki Chieftainship in democratic India. Economic and Political Weekly, LII(34), 21–22.

Haokip, N., &Lunminthang, M. (Eds.). (2011). Kuki society: Past, present and future, Maxford Books, New Delhi.

Haokip,P.S.(2008),Zalengam-The Kuki Nation, Saurabh Printers Pvt.Ltd.

Haolai, H. (2009). Assam gamakukitethusim, Printed at Mungrati Press, Haflong,Assam.

Haolai, T. (2006). Kuki culture in North Cachar Hills before and after the advent of Christianity, published by Assam Institute of Tribal Research, Guwahati.

Kipgen, N., & Haokip, D. L. (Eds.). (2021). Against the empire: Polity, economy and culture during the Anglo-Kuki War, 1917–1919. Routledge India.

Kipgen, S. (2015). Political and economic history of the Kukis of Manipur. Akansha Publishing House.

Lalsim, R. (2017). A brief account of the tribes of Dima Hasao, published by District Information and Public Relations Office, Dima Hasao, Assam.

Lunkim, T. (2013). Traditional system of Kuki Administration. In T. Haokip (Ed.), The Kukis of North East India: Politics and culture (pp. 1–10). Bookwell Publications

Mackenzie, A. (1884). History of the relations of the government with the hill tribes of the North-East Frontier of Bengal. The Home Department Press.

McCulloch, W. (1859). An account of the valley of Manipore and of the hill tribes, published by Mittal Publications, Delhi.

Shakespear, J. (1912). *The Lushei Kuki Clans*. Macmillan, London.

Shaw, W. (1997). Notes on Thadou Kuki (J. H. Hutton, Ed.),Spectrum Publication Guwahati, Assam.

H, Shonthang .*Thugilbukukitedanpi* custom book (Customary laws of Kukis), Kuki Baptist Convention Printing Press.

Sen, Sipra.(2009).Tribes and Caste of Assam,published by Gyan publishing House.

Songate, J. L. (1999). A historical study of the changes in the Hmar society of Manipur resulting from the introduction of Christianity, 1910–1935. Mississippi.

Tapadar, Z. A. (2007). Festivals of N.C. Hills (Vol. I). Department of Information and Public Relations, Assam.

Unpublished Thesis

Changsan, Lienkhomang, Unpublished Ph.D thesis on A Study of The Power Structure InThe Traditional And Contemporary Kuki Society in Dima Hasao District Of Assam, Department of Political Science,Dibrugarh University,2018.

Haokip, Lhingpineng, Unpublished Ph.D thesis on Traditional Administrative System and Customary Laws of the Thadou Kuki in Manipur, submitted to the Department of Political Science in Manipur University, Imphal, 2009.

HaolaiAvum; , Unpublished M.th thesis on A Historical Study of the Development of Christianity among the Kukis of N.C.Hills District, Serampore,1998.

Guite ,Chinkhanlian., Unpublished M.Phildesertation on Guite Chieftainship, NEHU, 1990.

Tuboi, Paochon, Unpublished Ph.D thesis on Socio-Cultural life of the kukis in Manipur, under Nehu University, Department of Sociology,2005.

Siksha Samhita Journal PDUAMD (2025) Vol 1(1):34-37; **ISSN : 3107-6335**

S.S.J.
PDUAMD

Transforming Justice: An Exploration of the Evolution of the Legal System in India and Recent Trends

Pinak Pani Basistha
Research Scholar, Bhattadev University, Bajali
Email: pinakpani214@gmail.com

Abstract :
With a rich history that outstrips all other legal systems in terms of antiquity and prestigiousness, India has the oldest judiciary in the world. The idea of consistent principles that regulate human behaviour and are applicable everywhere in the universe is the foundation of the concept of law. The cause-and-effect chain can be seen as a fundamental law even in the natural world. Laws in human civilizations can take many different forms, such as social standards, practices, and traditions. These rules establish a framework for social interaction and influence how people behave. With its long history, the Indian legal system has developed over time to integrate a number of legal frameworks and ideas. The Indian legal system has undergone significant transformations since its inception. From the colonial era to the present day, the system has evolved in response to changing social, economic, and political landscapes. This article provides a comprehensive overview of the evolution of the legal system in India, tracing its development from the British colonial period to the current era. The article also examines recent trends and developments, including the impact of technology and the growing emphasis on access to justice. This article aims to contribute to a deeper understanding of the Indian legal system and its ongoing evolution.

Keywords: Legal System, Evolution, India, Justice, Privacy, Technology, Environmental Protection, Recent Trends.

Introduction :
The notion of law is essential for the effective operation of any society, acting as a framework of regulations that govern and balance the intricate interactions within a diverse community (*Jain, 2016; Srikrishna, 2008*). Law serves as a comprehensive system of obligations and principles instituted by the government to promote societal welfare and ensure justice. The legal framework of India is a dynamic representation of the nation's social, political, economic, and cultural contexts *(Singh & Kumar, 2021; Chaudhuri, 2022).* The common law system, deeply rooted in India's extensive legal heritage, continues to significantly influence the development of the country's laws *(Austin, 1999; Jain, 2016).* In India, the primary sources of law include the Constitution, statutes, customary law, and judicial rulings from higher courts. The legislative structure is bifurcated between the central and state governments, with laws enacted by Parliament applicable nation wide or in designated areas, while laws formulated by state legislatures are generally enforceable within their respective state boundaries. A society, composed of individuals from various backgrounds, classes, castes, beliefs, ethnicities, genders, and identities, necessitates a structure that fosters harmony, tranquillity, and social progress. Law is crucial in facilitating this evolution, ensuring that distinctions among individuals based on their identities do not arise, and promoting a sense of unity. As a significant driver of social transformation, law possesses the capacity to cultivate a more just, equitable, and cohesive society *(Upendra, 2007).* This analysis investigates the development of the legal system in India, focusing on its historical changes and the

contemporary trends that are influencing the nation's justice framework(Srinu & Mallikarjuna, 2023**)**. From ancient times through the colonial era and into the present, India's legal system has experienced significant alterations. This intricate system, which reflects centuries of socio-political upheaval and cultural blending, is a rich synthesis of colonial legacies, customary laws, and modern legal notions. With its ancient roots firmly rooted in the rich soil of Vedic traditions and Dharmashastra, picture the Indian legal system as a magnificent banyan tree. While its branches go upward, welcoming modernity and advancement, these roots find support and sustenance in the knowledge of the past. The idea of law is complex and includes a range of guidelines and precepts that govern how people behave. Justice, morality, rationality, order, and righteousness are all represented by the law from a society standpoint. On the other hand, laws are made up of statutes, acts, rules, regulations, orders, and ordinances from a legislative standpoint.

Objectives

The specific objectives of the research paper are as follows:

1) To study the concept of Legal System.
2) To examine the evolution of Indian Legal System.
3) To analyse the recent trends and developments in the field of Law.

Methodology :

This study employs a qualitative research approach, combining historical and contemporary analyses. The article draws on a range of secondary sources, including journals, books, historical documents, legislative materials, and scholarly articles.

Evolution of the Legal System in India

Ancient India: Throughout its history, the Indian legal system has experienced substantial changes. The judicial system of ancient India, which existed from 1500 BCE to 500 CE, was founded on holy writings such as the 'Manusmriti' and 'Arthashastra.*(Srinu & Mallikarjuna, 2023).*' These writings set forth rules and guidelines for social behaviour and governance, with the idea of 'Dharma' (obligation) at the heart of the framework.

Medieval India: Throughout the Middle Ages, from 500 until 1757 CE, Islamic law and customs shaped the legal system***(****Dwivedi, 2021).* While the 'Dharmashastra' continued to rule Hindu law, Qazis and Muftis administered Islamic law. During this time, the Mughal Empire and the Delhi Sultanate had an enormous impact on the development of the legal system.

British Colonial Era: A streamlined legal system based on English common law was established with the arrival of British colonization *(Austin, 1999; Srikrishna, 2008)***.** In 1774, the British founded the Supreme Court in Calcutta, and in 1862, the High Courts in Bombay and Madras.

Codification of Laws: The Indian Penal Code (IPC) in 1860, the Indian Evidence Act in 1872, and the Indian Contract Act in 1872 were the results of British efforts to codify Indian law.

Indian Independence: Following India's independence in 1947, attempts were made to restructure and reform the legal system to better reflect the constitution's tenets of equality, justice, and social welfare.

Constitutional Enactment: The 1950 Indian constitution created a federal system of governance with the judiciary, executive branch, and legislature having distinct powers.

Judicial Activism: The Indian judiciary has become more activist in recent years, stepping in to protect citizens' rights in matters of public interest. In fields like social justice, human rights, and environmental protection, and historic rulings have been rendered.

Use of Technology: In order to improve access to justice, expedite court procedures, and enable virtual hearings, the Indian legal system is also embracing technology. Among the technology advancements being embraced are digital evidence presentation, online case management, and e-filing.

Social Justice Initiatives: In order to defend the rights of underrepresented groups, the Indian judiciary has also taken up a number of social justice initiatives. Examples include addressing issues pertaining to human rights and environmental protection, acknowledging the rights of transgender people, and offering legal assistance to the underprivileged.

Recent Trends and Developments in the field of Law

Technology and Digitalization: To improve court procedures, the Indian judiciary has been utilizing technology. Examples of this include virtual hearings, online case management platforms, and e-filing. As a result, there have been fewer delays, more efficiency, and greater accessibility for litigants.

Environmental Protection: The law has given environmental issues more consideration, which has resulted in historic rulings that support sustainable development and protect natural resources. These

covers situations involving pollution, deforestation, and the preservation of wildlife.

Corporate and Commercial Laws: As a result of India's significant economic reforms, corporate and commercial laws have changed. Examples of important legislative changes intended to streamline business procedures and enhance the country's ease of doing business include the implementation of the Goods and Services Tax (GST) and the Insolvency and Bankruptcy Code (IBC).

Public Interest Litigation (PIL): The concept of Public Interest Litigation has emerged as a vital mechanism, enabling citizens to pursue legal remedies for issues that impact the public and society as a whole. This development has enhanced access to justice for underrepresented communities and has resulted in pivotal rulings concerning environmental conservation, social equity, and human rights.

Right to Privacy: The Supreme Court of India has affirmed the Right to Privacy as an essential right, influencing aspects such as data security, surveillance practices, and individual autonomy. This ground-breaking ruling carries profound consequences for personal rights and liberties in the contemporary digital landscape.

Landmark Judgments for Social Justice: The judiciary have delivered significant rulings that support marginalized populations, including those advocating for women's rights, LGBTQ rights, and the rights of Dalits *(Vishaka v. State of Rajasthan, 1997; Navtej Singh Johar v. Union of India, 2018)*.. These decisions have addressed long-standing injustices and have instigated meaningful transformations within society.

Cultural Heritage Law: The framework of Cultural Heritage Law is designed to protect and maintain cultural heritage sites, artifacts, and expressions through both national and international legal instruments. This encompasses regulations concerning the safeguarding of monuments, antiquities, and sites of cultural significance.

Judicial Activism: The courts in India have demonstrated a notable inclination towards judicial activism, wherein they assume a proactive stance in the interpretation of the constitution and the safeguarding of fundamental rights. This approach has resulted in pivotal landmark rulings in fields such as environmental conservation, social equity, and human rights *(Sathe, 2002; Rao, 2008)*.

Animal Rights and Welfare: The advocacy for animal rights and welfare encompasses efforts to secure legal acknowledgment for animals, which entails the right to be protected from cruelty, exploitation, and undue suffering.

Conclusion

The Indian legal system has experienced a significant evolution, transitioning from its ancient origins to its current form. This journey has been characterized by key developments, such as the adoption of English common law, the systematic codification of laws, and the establishment of fundamental rights. Contemporary trends, including the integration of technology, the emergence of alternative legal service providers, and the increasing significance of environmental and sustainability law, are actively transforming the legal framework. As the legal profession progresses, it is crucial for law students, legal practitioners, and policymakers to remain knowledgeable and flexible. By embracing these transformative changes, we can better prepare ourselves for success in the future legal landscape. The future of law presents numerous opportunities for those who are willing to innovate, collaborate, and dedicate themselves to justice and equality. In conclusion, the advancement of justice in India necessitates a collective commitment to fostering a more just, equitable, and sustainable society. As we advance, it is imperative to uphold the tenets of justice, equality, and human rights while addressing the challenges and opportunities presented by the 21st century. By doing so, we can ensure thecontinued evolution and vitality of the Indian legal system, meeting the needs of all citizens and promoting a more just and equitable society for future generations.

Acknowledgements :

This is an independent work and it owes nothing to any person or organisation.

Conflict of Interest :

The author declares no conflicts of interest.

Authors' Contribution :

As the sole author, I made equal and full contribution in the present work.

Funding :

No specific funding was received for this research.

Ethics Statement :

No experiment has been done on humans and animals.

Informed Consent :

Proper consent was taken during collection of data and the privacy rights of the subjects have been respected.

References:

Chaudhuri, R. (2022). *The Indian legal system: An*

enquiry (Book review of *The Indian Legal System: An Enquiry*, by M. P. Singh & N. Kumar). *Asian Journal of Comparative Law, 17*(1), 277–279. https://doi.org/10.1017/asjcl.2021.38

Dwivedi, P. (2021). *Legal system in India* (pp. 1–23).

Nazim, S. (2023). Historical development of legal aid system in India: A legal perspective. *History and Sociology of South Asia, 17*(1), 69–84. https://doi.org/10.1177/22308075221120563

Saklani, S. K. (2019). Emerging trends in Indian competition law: Special reference to cartel. *International Journal on Emerging Technologies, 10*(2), 39–43.

Sarkar, S. C., & Sarkar, S. (2009). *Sarkar on the law of criminal procedure: The Code of Criminal Procedure, 1973 (Secs. 1–224)*. LexisNexis Butterworths.

Sarker, S. P., & Sharma, P. (2020). Bridging the gap: Understanding the trends in Indian legal education from recent developments. *Asian Journal of Legal Education, 7*(1), 57–72. https://doi.org/10.1177/2322005820908845

Singh, P., & Ranjan, R. (2024). Emerging trends in legal jurisprudence: Exploring evolving concepts and practices. In *The Lawway with Lawyers* (ISBN 978-93-340-3152-2).

Srikrishna, B. N. (2008). The Indian legal system. *International Journal of Legal Information, 36*(2), 244–256. https://doi.org/10.1017/S0731126500003024

Srinu, G., & Mallikarjuna, J. V. N. (2023). The legal system in India: A historic perspective. *International Journal of Sanskrit Research, 9*(1), 73–75.

Siksha Samhita Journal PDUAMD (2025) Vol 1(1):38-43; **ISSN : 3107-6335**

S.S.J.
PDUAMD

Policy Making and the Digital Evolution in India's Governance

Dr. Sarah Tahmeen Choudhury[1]
Dr. Niloofar Islam[2]
[1]Assistant professor, Department of Political Science, Govt. Model Degree College, Baghbar

[2]Assistant Professor, Department of History, Kaliabor College
Email: sarahchoudhury0@gmail.com

Corresponding Author
Dr. Sarah Tahmeen Choudhury

Abstract :
The digital age marks a transformative era for India, characterized by unprecedented technological advancements and significant socio-economic shifts. The digital revolution sweeping across the nation has fundamentally changed how individuals interact, how businesses operate, and how governance is conducted. Central to this transformation depends on strategic policymaking, which is crucial in addressing the numerous factors influencing this evolution.The paper examines the profound implications of various policy initiatives on essential aspects, such as the development of resilient digital infrastructure, the enhancement of cybersecurity measures, the establishment of robust data privacy regulations, and the promotion of widespread digital inclusion. The paper also highlights the myriad challenges faced by policymakers, including ethical dilemmas, the growing digital divide among different socio-economic groups, and the urgent need for global cooperation to tackle these challenges. It analyses strategies to foster a strong and equitable digital ecosystem in India, enabling all citizens to benefit from digital advancements while adeptly navigating the complexities of the digital age. It concludes with recommendations aimed at strengthening policy frameworks to ensure that India's digital transformation is efficient.

Keywords: India, policy-making,digital transformation, infrastructure, constraints.

Introduction :
The Digital Revolution has rapidly transformed the world over the past three decades, spreading far more quicklythan the Industrial or Agricultural Revolutions, particularlyin developing nations. Digitisation is "the economic and social transformation triggered by the widespread adoption of digital technologies to generate, process, share, and transact information" (Katz, Koutroumpis, &Callorda, 2014).Although the Digital Revolution began in the 20th century, its full potential is only now being realised in the business world. Globally, the digital economy plays a pivotal role in economic development, boosting productivity in new and existing industries, opening new markets, improving standars of life, and promoting sustainable growth. The rapid spread of digital technologies over the last two decades has sparked excitement about the possibilities for global development in the digital age. Never the less, the anticipated benefits of digital technology— such as increased growth, more job opportunities, and improved public services— have not been fully realized. This evolving world gave rise to the Fourth Industrial Revolution, which blends digital, biological, and physical technologies in transformative new ways.

The vision of India's digital future is intrinsically linked to its efforts to incorporate technology into governance. Shri Narendra Modi , the Prime Minister of India has highlighted the pivotal partof e-governance in realizing India's aspirations for a digital society (Malodia et al., 2021; Gupta et al., 2020; Rêgo et al., 2021). While significant strides of digital transformation have already made by developed nations in many sectors, India has beenincreasingly acknowledging the necessity of digitizing data collection and enhancing information management practices. The country's burgeoning adoption of technology and prioritizing digitalization are reshaping the information

management landscape. These initiatives aim to revamp the processes of governance, strengthen access to information, boost transparency, and empower citizens through digital platforms (Malodia et al., 2021; Mukherjee & Narang, 2022; Holl & Rama, 2023). India can improve service delivery, expedite operations, and promote inclusive growth by using technology into government. The nation's current digital transformation might greatly enhance public engagement, reorganise governance, and improve service delivery. India can boost economic growth, create a more empowered and inclusive community, and increase access to information and services by embracing technology. (Chen et al., 2022, Echebarria et al, 2021, Sindakis and Showkat, 2024).

Globally, digital technologies like mobile apps and cloud computing have been vital forces behind both economic expansion and citizen empowerment. India has established itself as one of the top economies among developing countries thanks to its impressive scientific and technological advancements. (Tripathi & Dungarwal, 2020,Lema et al., 2021). Understanding that information and communication technology (ICT) offers enterprises enormous growth potential, the Indian government is positioning itself as a worldwide partner in digital transformation (Ghobakhloo & Iranmanesh, 2021). With ongoing technological advancements, India is committed to being a digitally transformed country that offers substantial benefits to the government, people, professionals, and corporate investors (Manda et al., 2019, Sindakis and Showkat, 2024).

Policymakers and the Digital Age

Policymakers has a pivotal part in shaping the digital landscape by developingregulations that balance fostering innovation, ensuring security, and addressing ethical concerns. As technology evolves rapidly, they must tackle issues like data privacy, cybersecurity, misinformation, and the ethics of artificial intelligence. Strong, effective policies are essential to promoting fair competition, preventing monopolies, and safeguarding users' rights in an increasingly digital worldd. The key responsibilities of policymakers include:

Building Digital Infrastructure

Policymakers have prioritised digital infrastructure through various schemes, like Bharat Net aims to provide high-speed broadband to 250,000 villages. The developmentof urban digital infrastructure, including the creation of smart cities, is supported by the Smart Cities Mission. Additionally, reforms in the telecom sector have made mobile and internet services more affordable, resulting in the widespread adoption of 4G and the rollout of 5G services.

Bridging the Digital Divide

Policymakers are working to address the disparities between rural and urban populations through programs such as - Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), which emphaises on digital literacy. Efforts are also being made to expand internet connectivity to marginalised communities and remote areas, ensuring greater inclusivity in the digital world.

Promoting Digital Governance

E-governance initiatives, such as Aadhaar, DigiLocker, and the Unified Payments Interface (UPI), have revolutionised service delivery. By integrating technology into public service delivery, policymakers have reduced corruption and increased transparency in governance.

Regulating Data Protection and Privacy

The Personal Data Protection Bill (PDPB) is a crucial piece of legislation to ensure data sovereignty and protect citizens' personal information. Policymakers must carefully balance protecting user data and fostering an environment that encourages business growth and innovation.

Encouraging Innovation and Entrepreneurship

Initiatives like Start-up India provide benefits and resources to assist technology start-ups. Policymakers encourage research in cutting-edge technologies, including artificial intelligence, blockchain, and quantum computing, through programs like NITI Aayog's National Strategy on Artificial Intelligence.

Ensuring cybersecurity

The National Cyber Security Policy (2013) was introduced to protect critical infrastructure and combat cybercrime. However, as new threats emerge, there is a growing need for an updated cybersecurity policy to address challenges like ransomware and cross-border cyberattacks.

Regulating Emerging Technologies

Policymakers play a key role in developing regulatory frameworks for emerging technologies like- artificial intelligence, blockchain, cryptocurrency, and gig economy. It includes addressing ethical challenges such as bias in automation and the affect of artificial intelligence on jobs, as well as ensuring that the benefits of these technologies are broadly shared.

Key Policy Initiatives in India's Digital Landscape

In current years, the digital infrastructure of India has experienced a significant transformation, establishing the nation as a worldwide leader in digital adoption. Numerous important projects, schemes and initiatives have been introduced to strengthen the digital framework of the country. Some of the major initiatives include:

Data Centres

India's digital framework is increasingly supported by the growth of data centres, essential for cloud computing, data storage, and AI/ML technologies. The sector is projected to expand significantly, with an estimated IT load capacity increase of around 1000 MW.

The National Informatics Centre (NIC) has set up state-of-the-art National Data Centres (NDC) in Hyderabad, Bhubaneswar, Pune, and Delhi. These NDCs offer critical cloud services to government organisations, such as hosting and disaster recovery, to guarantee continuous operations. For a variety of cloud applications, these centres currently use about 5,000 servers and have a storage capacity of almost 100 PB.A new Tier-III NDC facility with 200 racks that may be expanded to 400 is being built in Guwahati, Assam. With dependable data storage and cloud solutions, the National Data Centre – North East Region (NDC-NER) was established in September 2020 to solve regional issues and advance socioeconomic growth. (MoIB, 2024).

National Informatics Centre (NIC)

India's growingcloudservice framework has playeda crucial role initsdigital evolution. The improvement of NIC National Cloud Services, which began in 2022, seeks to enhance the national cloud infrastructure even more, allowing for quicker and more effective provision of e-Governance services. These cloud services are currently utilised bymorethan 300 government agencies, contributing to the rapid growthof India's digital public infrastructure (MoIB,2024)

GI Cloud (Megh Raj)

In order to establish a comprehensive national cloud ecosystem, the GI Cloud (Megh Raj) program aims to provide Information and Communication Technology (ICT) services through the cloud to all government agencies at the federal, state, and union territory levels. Megh Raj improves IT infrastructure and expedites the rollout of e-government applications such as identity verification, digital payments, and consent-baseddata sharing. The Ministry of Electronics and Information Technology (MeitY) has begun the process of selecting Cloud Service Providers (CSPs) in order to meet the changing cloud requirements of government agencies (MeitY, GoI).

Digital India Initiative

Launched in 2015, the Digital India program seeks to make India a knowledge-driven economy and a society empowered by technology. From scanned papers to physical records, the Digital India Platform (DIP) offers digitisation services to businesses. Itseeks to produce data extracts for document management and record handling, as well as to make all currently available content usable in various media, languages, and forms.The platform streamlines digital public service delivery, encourages a paperless workplace, gives residents on-demand access, creates freearchive storage, and automates the processing and extraction of pertinent data for study (MoIB,2024).

Unified Payments Interface (UPI)

The Unified Payments Interface (UPI) system consolidates various bank accounts into one mobile app, enhancing banking functionalities, fund transfers, and payments to merchants. UPI enables electronic payments and promotes financial inclusion. By June 30, 2024, it had handled 24,100 crore financial transactions, transforming India's payment eco system. (MoIB, 2024).

Unified Mobile Application for New-Age Governance (UMANG)

By combining services from several industries, including pensions, health, education, and agriculture, the Unified Mobile Application for New-Age Governance (UMANG) streamlines access to government services. UMANG is a single platform for residents to access services and conduct transactions, with over 71.2 million users. Currentlyoffering 2,077 services from 207 government agencies throughout 32 states and union territories, including 738 Direct Benefit Transfer (DBT) services, the application is available in 23 languages, including Hindi and English. Together, these programs help India's digital transformation, fostering economic growth, boosting the provision of public services, and raising the standard of living for all Indians.

Challenges Faced by Policymakers

Numerous obstacles havebeen faced by policy makers in the process of digital evolution. A few of the challenges are :

Digital Divide and Infrastructure Gaps

One of the most urgent issues is the ongoingdigital divide, wherecertain segments of the population, particularly those in rural and isolated areas, experience limited access to digital infrastructure and technology (Shen et al., 2021). This includes unreliable internet access, high costs of devices, and insufficient digital literacy, which restrict these communities' ability to engage in the digital economy and utilize online services. The unequal distribution of digital infrastructure has resulted in differences in service quality, with urban areas generally receiving better services than rural or remote regions (IAMAI, 2022). Bridging this digital divide and guaranteeing equal access to digital technologiesis essential for promoting inclusive growth.

Lack of Digital Literacy and Skills

A major barrier to inclusive digitalisation is the lack of digital literacy among marginalized communities. Many individuals, especially from low-income or rural backgrounds, struggle to use digital technologies effectively, limiting their engagementin the digital economy. To address this, comprehensive digital literacy programs and skills training should be integrated into the education system to empower these communities and enhance their participation in digital transformation.

Regulatory and Policy Challenges

The successful rollout of inclusive digitalisation depends on a strong regulatory and policy framework. Data security and privacy, robust cybersecurity measures, the regulation of emerging technologies like artificial intelligence and blockchain must be effectively addressed to build trust and confidence in the digital ecosystem (Shen et al., 2021,Singh,2024).

Cyber security Threats

India has seen a significant increase in cyberattacks targeting critical infrastructure, financial institutions, and individual users. Strengthening cybersecurity capabilities and fostering international collaboration are essential to counter these threats and ensure digital infrastructure security.

Ethical and SocialConcerns

Emerging ethical and social concerns, such as job displacement due to automation, algorithmic biases in AI systems, and digital addiction, require proactive policymaking. These issues must be addressed carefully to ensure that the benefits of digitalisation are inclusive and that the social impact is mitigated.

Recommendationsfor Policymakers

A comprehensive strategy that includes community-driven initiatives, private-sector collaborations, and government activities is necessary to fully utilise digitisation for growth in India.

Strengthening Digital Infrastructure and Connectivity

A key first step in driving digitalisation is enhancing infrastructure and ensuring universal access to reliable and affordable internet. Government initiatives like BharatNet are poised to deliver high-speed internet access to every village council, effectively bridging the digital divide (BBNL, 2023). Strategic partnerships between the public and private sectors, along with community-owned networks, significantly enhance internet access in underserved areas (Shen et al., 2021,Singh,2024)

Promoting Digital Literacy and Skills Development

Tackling the digital skills deficit necessitates the incorporation of digital literacy into the educational framework and the provision of specific training initiatives for marginalized groups. Programs such as the National Digital Literacy Mission and Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA) represent significant advancements in this area (MeitY, 2023; PMGDISHA, 2023). Joint efforts ofthe government,civil societyand private actors can enhance community-based approaches, like digital literacy centers and customized skill development initiatives, to engage with at-risk populations (Shen et al., 2021).

Strengthening Digital Financial Inclusion

Making digital financial services like mobile banking and digital payments moreavailable is important for helping everyone access financial resources. Programs such as the Unified Payments Interface (UPI) and Pradhan Mantri Jan Dhan Yojana (PMJDY) have achieved a lot in this area (PMJDY, 2023). However, further integration of these services with existing banking infrastructure and innovative solutions tailored to underserved communities is needed (KPMG, 2021). Collaboration between the government, financial institutions, and fintech companies can accelerate this progress.

Using Digital Technologyin Education and Healthcare

Integrating digital technologies into healthcare and education can significantly improve access and service quality for marginalised communities. Expanding initiatives like telemedicine, mobile health apps, and online learning platforms is essential, focusing on reaching remote and under served areas (Shen etal., 2021). Programssuch astheNational Digital Health Mission, PM e-Vidya,private- public partnerships can have a major part in ensuring digital transformation's benefits are distributed equitably (MoHFW, 2020; MHRD, 2020).

Fostering Digital Entrepreneurship and Employment Opportunities

Facilitating the participation of marginalized sections in the digital economy, both as entrepreneurs and employees, is essential for fostering inclusive growth.. Initiatives that support digital entrepreneurship—such as incubators, accelerators, and access to digital tools—can help individuals from diverse backgrounds start and scale businesses (Shen et al., 2021). Additionally, the rise of the gig economy and digital platforms offers flexible employment opportunities for youth and other marginalised groups. Ensuringfair practices and social security and skill-building programs will further enhance thepotential of digitalisation to create inclusive employment.

Strengthening Regulatory and Policy Frameworks

A strong policy framework and regulatory measures are crucial for inclusive digitalisation, addressing data privacy, cybersecurity, and emerging technology governance to ensure equitable benefits from digital transformation (Shen et al., 2021). Policy alignment across finance, healthcare, and education sectors will support a coordinated approach to digitalisation. Moreover, involving marginalised communities in policymaking will help ensure that their needs are adequately addressed.

Conclusion

India's impressive advancements in digital infrastructure show how committed the country is to efficiency, inclusivity, and innovation. With the help of innovative programs like Aadhaar, UPI, and DigiLocker, as well as cutting-edge technologies like cloud computingand artificial intelligence, interms ofdigital adoption, India has emerged as a global leader. Government initiatives and active citizens are laying the groundwork for a digital future that enhances governance, empowers individuals, and promotes socioeconomic prosperity. This digital transformation empowers India to take a leading role in delivering scalable digital solutions to the Global South while simultaneously enhancing its own internal capacities. India is ready to reshape the future of governance, economic growth, and public service delivery as it develops further.

Acknowledgements:

The authors express their gratitude to colleagues and well-wishers for their valuable discussions and moral support during the preparation of this manuscript.

Conflict of Interest:

The authors declare no conflicts of interest.

Authors' Contribution:

Both authors contributed equally to the conceptualisation, data analysis, interpretation, and writing of this manuscript.

Funding:

No specific funding was received for this research.

Ethics Statement:

No experiment has been done on humans and animals.

Informed Consent:

Proper consent was taken during collection of data, and the privacy rights of the subjects have been respected.

References :

Barrutia, J.M., & Echebarria, C.(2021). Effect of the COVID-19 pandemic on public Managers' attitudes toward digital transformation. Technology in Society, 67, 101776.

Bharat Broad band Network Limited (BBNL). (2023). Bharat Net project. Retrieved from: https://www.bbnl.nic.in/

Chen, W., Botchie, D., Braganza, A., & Han, H.(2022).A transaction cost perspective on blockchain governance in global value chains. Strategic Change, 31(1), 75–87.

Ghobakhloo, M., & Iranmanesh, M. (2021). Digital transformation success underIndustry 4.0: A strategic guideline for Manufacturing SMEs. Journal of Manufacturing Technology Management, 32(8), 1533–1556

Gupta, R., Pal, S. K., &Muttoo, S. K. (2020). Data analytics for better branding of e-governance and e-business systems: Case of "Digital India" campaign. In Leveraging digital innovation for governance, public administration, and citizen Services: Emerging research and opportunities (pp. 51–78). IGI Global.

Holl, A., & Rama, R. (2023). Spatial patterns and drivers of SME digitalisation. Journal of the Knowledge Economy. https://doi.Org/10.1007/s13132-023-01257-1

IAMAI. (2022). India Internet 2022. Internet and Mobile Association of India. Retrieved from https://core.ac.uk/download/pdf/382871343.pdf

Katz, R., Koutroumpis, P., & Martin Callorda, F. (2014). Using a digitisation index to Measure the economic and social impact of Digital agendas. Info, 16(1), 32-44.

Lema, R., Kraemer-Mbula, E., & Rakas, M. (2021). Innovation in developing countries: Examining two decades of research. Innovation and Development, 11(2–3), 189–210.

Malodia, S., Dhir, A., Mishra, M., & Bhatti, Z. A. (2021). Future of e-Government: An integrated conceptual framework. Technological Forecasting and Social Change, 173, 121102.

Ministry of Electronics and Information Technology (MeitY). (2023). National Digital Literacy Mission. Retrieved from https://ndlm.in/

Ministry of Health and Family Welfare (MoHFW). (2020). National Digital Health Mission. Retrieved from https://www.nhp.gov.in/national-digital-healthmission_(ndh.

Ministry of Information & Broadcasting (MoIB) (2024) retrieved from https://pib.gov.in/PressReleasePage.aspx?PRID=2082144.

Mukherjee, S., & Narang, D. (2022). Digital economy and work-from-home: The rise of home offices amidst the COVID-19 Outbreak in India. Journal of the Knowledge Economy. https://doi.org/10.1007/s13132-022-00896-0

Pradhan Mantri Jan Dhan Yojana (PMJDY). (2023). PMJDY – Empowering the Unbanked.Retrieved from Compu, Y., Hu, W. &Hueng, C. J. (2021). Digital Financial InclusionandEconomicGrowth:across-countrystudy.ProcediaComputerScience,187, 218-223.

Shen, Y., Hu, W. &Hueng, C. J. (2021). Digital Financial Inclusion and Economic Growth: a cross country Study. Procedia Computer Science, 187, 218-223.

Sindakis,S& Showkat, G .(2024). The Digital Revolution in India: Bridging the Gap in Rural Technology Adoption. Journal of Innovation and Entrepreneurship.https://doi.org/10.1186/s13731-024-00380-w

Singh, S. (2024). Digitalisation for Inclusive Growth in India. International Journal of Engineering and Management Research.DOI: 10.5281/zenodo.13163724

Tripathi, M., &Dungarwal, M. (2020). Digital India: Role in development. International Journal of Home Science, 6, 388–392

Siksha Samhita Journal PDUAMD (2025) Vol 1(1):44-48; **ISSN : 3107-6335**

S.S.J.
PDUAMD

Green Urbanisation and Urban Displacement : A Case Study of Guwahati City's Sustainable Development Challenges

Megha Choudhury
Assistant Professor,
Department of Political Science,
Tihu College, Tihu, Assam
Email:choudhury.megha8@gmail.com

Abstract:
The study aims to analyse the intersection of green urbanisation and urban displacement in the Guwahati city of Assam, a rapidly growing city and the gateway to North East India. Green urbanisation is driven by the concept of sustainable development. However, rapid urban expansion and extreme climate change have led to the displacement of marginalised populations, particularly those residing in informal settlements. Hence, green urbanisation has become the priority of most cities, including Guwahati. This study investigates the political and social dynamics surrounding green urban projects and their impact on urban displacement. By analysing the political economy of urban development in Guwahati, the study seeks to highlight the challenges in balancing environmental sustainability with social equity, providing policy recommendations to address the needs of the displaced communities.

Keywords: green urbanisation, urban displacement, sustainable development, sustainability, marginalised.

Introduction:
Guwahati is the largest city in Assam and a key urban centre in the northeastern region of India. The cityhas been experiencing rapid urbanisation in recent years. It has witnessed a significant influx of migrants due to its economic growth, infrastructural development, and strategic location as a gateway to Southeast Asia. However, this urban growth has also been accompanied by a rise in environmental challenges, including deforestation, pollution, and the degradation of water bodies. In response to these challenges, there has been an increasing emphasis on green urbanisation, which signifies the integration of environmentally sustainable practices in urban planning.

Green urbanisation policies in Guwahati have majorly involved the development of parks, the promotion of green technologies, and the protection of natural resources. While these efforts are necessary for addressing environmental concerns, they have often led to the displacement of marginalised communities, particularly those living in informal settlements along the banks of rivers or areas designated for green projects. This paper aims to explore the political and social dynamics of green urbanisation in Guwahati city, specifically focusing on the impact of these policies on urban displacement.

Research Objectives:
The objectives of this study are as follows:

i. To examine the role of green urbanisation in the displacement of marginalised communities in Guwahati city.

ii. To explore the political, economic, and social factors that influence urban displacement in the context of green urban development.

iii. To assess the effectiveness of policies related to green urbanisation and their impact on vulnerable populations.

iv. To propose recommendations for balancing environmental sustainability with the protection of displaced communities' rights and livelihoods.

Literature Review:
Green urbanisation is increasingly becoming a priority in Indian cities, as urban areas grapple with

environmental challenges such as air pollution, water scarcity, and climate change. Urbanisation is expected to be the dominant trend in India over the next few decades, with projections indicating that nearly 50% of the population will reside in cities by 2050. The concept of green urbanisation involves the development of green spaces, the use of renewable energy, and the promotion of sustainable transport options. However, these green initiatives often conflict with the needs of the urban poor, who may be displaced by large-scale infrastructure and environmental projects (Bandyopadhyay, 2020).

Guwahati, like many other rapidly urbanising cities in India, has experienced significant displacement as a result of development projects. Informal settlements, often situated in ecologically sensitive areas like floodplains or riverbanks, are particularly vulnerable to eviction as part of green urbanisation initiatives. According to the Assam State Urban Development Agency (ASUDA), around 10% of Guwahati's population lives in informal settlements, which are often viewed as obstacles to urban development and green initiatives (ASUDA, 2019). These communities face challenges related to access to basic services, housing insecurity, and limited political representation.

The politics of displacement in Guwahati is shaped by a combination of local governance, political will, and the interests of urban elites. Development projects often prioritise infrastructure over the welfare of displaced populations, with little regard for the social and economic impact on these communities. Political actors, including local politicians and real estate developers, play a significant role in determining the outcomes of urban development policies. The lack of a comprehensive rehabilitation and resettlement framework exacerbates the vulnerability of displaced populations (Sahu, 2018).

Research Methodology:

This study employs a mixed-method research design to explore the relationship between green urbanisation and urban displacement in Guwahati. The methodology combines qualitative data (interviews, case studies, and focus groups) with quantitative data (census data, surveys) to provide a comprehensive analysis of the issue.

Data and Findings:

The rapid urbanisation of Guwahati, the largest city in Assam, is a microcosm of the broader urbanisation trends occurring across India. Green urbanisation, which promotes sustainable and environmentally friendly urban development, is an essential component of tackling climate change and environmental degradation. However, this form of urbanisation in Guwahati often results in the displacement of marginalised communities, creating a complex political and social issue that requires an in-depth exploration of its causes, effects, and the role of governance.

Urban Displacement in Guwahati: Urban displacement in Guwahati is a result of both government-led development projects and the rapid expansion of informal settlements. These settlements, largely situated in ecologically sensitive and flood-prone areas like the banks of the Brahmaputra River and in low-lying areas, are increasingly being targeted for urban redevelopment, including green urbanisation projects. As Guwahati continues to grow both in population and economic importance, a substantial part of the city's population lives in informal settlements, which are not legally recognised and lack secure tenure. According to a report by the Assam State Urban Development Agency (ASUDA, 2019), around 10% of Guwahati's population resides in informal settlements, many of which are situated along floodplains and riverbanks.

These areas, once seen as marginal, have become crucial for housing the urban poor. However, due to the rapid urban expansion and the growing need for infrastructure development, including the creation of green spaces, many of these informal settlements face eviction and displacement. One of the major projects contributing to this displacement is the Brahmaputra Riverfront Development Project, aimed at transforming the riverbank areas into a clean and green space, which has been proposed as part of the larger vision for making Guwahati a smart and sustainable city.

Case Study of the Brahmaputra Riverfront Development Project: The Brahmaputra Riverfront Development Project is one of the key green urbanisation initiatives in Guwahati, which involves the creation of parks, promenades, and public spaces along the river. While this initiative seeks to enhance environmental sustainability by protecting the river and promoting green infrastructure, its implementation has led to the forced eviction of numerous households living along the riverbanks. These communities, most of whom are migrants from rural areas or economically marginalised groups, are now facing displacement without adequate compensation or resettlement options.

The eviction of slum dwellers, including those who have lived along the river for decades, has created significant challenges. The local government has struggled to provide suitable alternative housing or adequate financial compensation to those displaced. As a result, many displaced individuals have moved to the outskirts of the city, often in poorly planned resettlement colonies that lack essential services such as water, sanitation, and transportation. In some cases,

displaced populations have become even more vulnerable to economic hardships as they no longer have access to their previous sources of livelihood, such as fishing and small-scale trading along the river.

*Data on Displacement and Green Projects:*According to local government estimates and media reports, more than 5,000 households were displaced due to the riverfront development alone. These individuals were mostly from low-income groups who had settled in informal settlements along the Brahmaputra over the past few decades. The Assam State Urban Development Agency (ASUDA) data reveal that over 60% of these households were engaged in informal employment, including street vending, day labour, and small-scale agriculture. The displacement has left many without a source of income, further exacerbating their vulnerability.

The green urbanisation projects in Guwahati often fail to take into account the livelihoods and socio-economic needs of these displaced populations. There is a significant gap between the environmental objectives of these projects and the protection of the displaced communities' social and economic rights. The displaced communities' lack of political representation and limited bargaining power further weakens their ability to negotiate better relocation options, highlighting the unequal power dynamics at play in urban development.

*Political Economy of Urban Displacement:*The politics of urban displacement in Guwahati are deeply entangled with broader economic and political interests. Guwahati's urban development policies are shaped by a coalition of local politicians, real estate developers, and the state government, all of whom have vested interests in promoting urban growth. Green urbanisation projects are often viewed as vehicles for economic growth and infrastructure development, but they disproportionately affect the urban poor who are pushed out of prime areas for real estate development.

*Role of Political Actors:*Local politicians in Guwahati, particularly those aligned with the ruling party, play a significant role in shaping the direction of urban development. Political support for large-scale infrastructure and urban beautification projects often aligns with the interests of real estate developers, who stand to gain from the redevelopment of urban areas. For instance, the Brahmaputra Riverfront Development Project is seen not only as an environmentally sustainable initiative but also as a lucrative opportunity for real estate development along the riverfront.

Real estate developers, backed by political connections, are key actors in the displacement process. These developers benefit from the increase in land value once informal settlements are cleared and urban spaces are redeveloped. In Guwahati, the rise of public-private partnerships (PPPs) has further fuelled this trend, where private developers and public entities collaborate to undertake large urban development projects.

*Gaps in Governance and Policy:*The gap between the political economy of urban development and the needs of displaced communities can be attributed to weak governance structures and ineffective policy enforcement. Despite the existence of policies such as the National Rehabilitation and Resettlement Policy (2007) and the Assam State Rehabilitation Policy, these laws have been poorly implemented in Guwahati. There is often little accountability for the adequate compensation of displaced individuals, and resettlement options are frequently inadequate, lacking basic amenities such as sanitation, healthcare, and access to public transport.

This lack of political will to address the needs of the displaced reflects a broader trend of neglecting the rights of informal settlers. Local governments and urban planners tend to prioritise the aesthetic and economic goals of urbanisation over the socio-economic rights of marginalised communities. The displacement of informal settlers, especially those living in riverfront areas or flood-prone regions, is often justified by the notion of "urban renewal" or the need for environmentally sustainable practices, leaving little room for debate on the social consequences.

*Socio-Economic Consequences of Displacement:*The socio-economic impacts of displacement in Guwahati are multifaceted and have far-reaching consequences for affected communities. The loss of housing and livelihoods often leads to a vicious cycle of poverty and marginalisation. Displaced individuals face not only the trauma of losing their homes but also the disruption of their social networks, employment, and access to public services.

*Loss of Livelihoods:*The majority of displaced individuals in Guwahati are engaged in informal sector work, such as street vending, small-scale agriculture, or daily wage labour. Many of these livelihoods are closely tied to their physical location, particularly along the riverfront, where fishing and small trading activities are common. Once displaced, these individuals find it difficult to rebuild their livelihoods in resettlement colonies or new areas of the city. The lack of proper resettlement sites and opportunities for economic integration into the city's mainstream economy exacerbates their vulnerabilities.

*Disruption of Social Networks:*The displacement of communities often leads to the breakdown of social networks that have existed for years. Many of the displaced people have lived in close-knit communities where mutual support systems, such as childcare, healthcare, and community security, were a part of daily life. Once relocated, these support systems collapse, leading to social isolation and a loss of community identity.

*Increased Vulnerability:*Displaced populations are particularly vulnerable to economic and social exclusion. Without access to affordable housing, healthcare, or education, these communities face higher risks of exploitation, violence, and social marginalisation. Moreover, without proper documentation of their status or land rights, they often fall outside the purview of government welfare programs. The lack of political representation for these communities further exacerbates their exclusion from policy discussions and resource allocation.

Discussion:

The findings of this study indicate that while green urbanisation projects in Guwahati are necessary to address environmental challenges, they often lead to the displacement of marginalised communities. The political economy of urban development in the city reveals a disconnect between the goals of environmental sustainability and the protection of displaced populations' rights. Local governance structures, political will, and economic interests often prioritise urban beautification and infrastructure development over the welfare of vulnerable groups.

To address these challenges, the following policy recommendations are proposed:

i. **Inclusive Urban Planning**: Green urbanisation projects must include displaced communities in the planning and decision-making process. Participatory planning can ensure that the needs of marginalised populations are considered in development projects.

ii. **Comprehensive Rehabilitation and Resettlement Policies**: The government should implement clear and comprehensive policies for the rehabilitation and resettlement of displaced individuals. These policies must guarantee adequate compensation, access to housing, and social services.

iii. **Strengthening Local Governance**: Local governments should be empowered to balance environmental goals with social equity considerations. Ensuring that local communities are represented in urban planning processes is crucial for addressing displacement issues.

iv. **Sustainable Livelihood Programs**: Displaced individuals should be provided with sustainable livelihood opportunities, including skill training and employment in green industries, to help them rebuild their lives.

Conclusion:

Guwahati has witnessed considerable urban growth in recent years, with informal settlements emerging along the Brahmaputra River and flood-prone areas. These areas have become targets for green urbanisation projects, which often involve riverfront development, park creation, and the construction of public spaces. For example, the development of the Brahmaputra Riverfront Development Project in the city has led to the displacement of numerous informal settlers along the riverbanks. In the absence of adequate resettlement plans, many of these individuals face increased vulnerability and limited access to basic services.

The politics of displacement in Guwahati is influenced by the interests of real estate developers, local politicians, and urban elites. The Assam state government has prioritised the beautification of public spaces, such as parks and waterfronts, in line with the broader goals of green urbanisation. However, the voices of displaced communities are often marginalised in these decision-making processes. Political pressure from powerful landowners and developers has resulted in the displacement of vulnerable populations without adequate compensation or resettlement options.

Displaced individuals face significant socio-economic challenges. Many have lost their livelihoods, access to basic amenities, and social networks. For example, a significant portion of the displaced population in Guwahati depends on small-scale agriculture, fishing, or daily wage labour. Displacement has disrupted these livelihoods, leaving many people without adequate sources of income. Additionally, resettlement sites are often located far from the city centre, making it difficult for displaced individuals to access employment opportunities and urban services.

Green urbanisation presents an opportunity to address the environmental challenges faced by rapidly growing cities like Guwahati. However, these efforts mustn't come at the expense of marginalised communities. The politics of displacement in Guwahati reflect broader issues of urban inequality, where economic and political elites often benefit from development projects, while vulnerable populations are displaced without adequate support. To achieve sustainable and equitable urban growth, it is essential to integrate the principles of social justice into green urbanisation policies and ensure that displaced communities are provided with adequate support and opportunities.

Acknowledgements :
This is an independent work and it owes nothing to any person or organisation.

Conflict of Interest :
The author declares no conflicts of interest.

Authors' Contribution :
As the sole author, I made equal and full contribution in the present work.

Funding :
No specific funding was received for this research.

Ethics Statement :
No experiment has been done on humans and animals.

Informed Consent :
Proper consent was taken during collection of data and the privacy rights of the subjects have been respected.

References:

Ahluwalia, I.J. (2016). Challenges of Urbanisation in India. In: Besley, T. (eds) Contemporary Issues in Development Economics. International Economic Association Series. Palgrave Macmillan, London. https://doi.org/10.1057/9781137529749_10

Amirante, D. (2012). Environmental courts in comparative perspective: Preliminary reflections on the National Green Tribunal in India. Pace Environmental Law Review, 29(2), 441-469.

Assam State Urban Development Agency (ASUDA). (2019). Urbanization and Displacement in Guwahati: A Policy Perspective.

Bandyopadhyay, A. (2020). Green Urbanization in India: Challenges and Opportunities. Urban Studies Journal.

Bhagat, R. B., & Hassan, M. I. (2025). Urbanisation and Urban Policies in India. In *Exploring urban change in South Asia*. Springer Nature. https://doi.org/10.1007/978-981-96-3181-0

Chan, F. K. S., & Chan, H. K. (2022). Recent research and challenges in sustainable urbanisation. *Resources, Conservation and Recycling*, *184*, 106346. https://doi.org/10.1016/j.resconrec.2022.106346

Cho, H.S. (2007-2008). Against the viability of private enforcement: Focusing on Korean environmental Law. *Journal of Korean Law*, 7, 81-108.

Emerson,K., Nabatchi,T., E'Leary, R. & Stephens, J. (2003). *The challenges of environmental conflict resolution*. In Rosemary E'Leary and Lisa B. Bingham (Eds.) The Promise and Performance of Environmental Conflict Resolution (pp. 3-26). Washington, D.C: RFF Press Book.

Green, A. S., & Petrie, C. A. (2018). Landscapes of Urbanisation and De-urbanisation: Integrating Site Location Datasets from Northwest India to Investigate Changes in the Indus Civilisation's Settlement Distribution. *Apollo (University of Cambridge)*. https://doi.org/10.17863/cam.20790

Han, H. (2018). Governance for green urbanisation: Lessons from Singapore's green building certification scheme. Environment and Planning C: Politics and Space, 37(1), 137–156. https://doi.org/10.1177/2399654418778596

Imam, A. U. K., & Banerjee, U. K. (2016). Urbanisation and greening of Indian cities: Problems, practices, and policies. Ambio, 45(4), 442–457. https://doi.org/10.1007/s13280-015-0763-4

Kaur, N., Kaur, M., Padhi, S. S., & Singh, K. K. (2022). Geospatial analysis of the distribution of urban green spaces: a study of four Indian cities. *Cities & Health*, *6*(3), 443–459. https://doi.org/10.1080/23748834.2021.1941722

Kwilinski, A., Lyulyov, O., & Pimonenko, T. (2023). The Effects of Urbanisation on Green Growth within Sustainable Development Goals. Land, 12(2), 511. https://doi.org/10.3390/land12020511

Kundu, D. (2020). Urbanisation in India: Towards a National Urban Policy Framework and Smart Cities. In: Kundu, D., Sietchiping, R., Kinyanjui, M. (eds) Developing National Urban Policies. Springer, Singapore. https://doi.org/10.1007/978-981-15-3738-7_4

Nath, V. (1986). Urbanisation in India: Review and Prospects. *Economic and Political Weekly*, *21*(8), 339–352. https://www.jstor.org/stable/4375369

Sahu, P. (2018). The Politics of Displacement in Guwahati: Urban Development and Social Justice. Political Science Review.

Turaga, R. M. R., Jha-Thakur, U., Chakrabarti, S., & Hossain, D. (2020). Exploring the role of Urban Green Spaces in "smartening" cities in India. Impact Assessment and Project Appraisal, 38(6), 479–490. https://doi.org/10.1080/14615517.2019.1690864

Wang, X., Kumari, D. (2021). A Socio-Ecological Perspective on Green Urbanisation and Urban Ecological Intensification. In: Achal, V., Chin, C.S. (eds) Building Materials for Sustainable and Ecological Environment. Springer, Singapore. https://doi.org/10.1007/978-981-16-1706-5_10

Wang G, Salman M, Zhang K. The impact of urbanisation on green total factor productivity: exploring threshold and mediating effects of human capital. Int J Health Plann Mgmt. 2024;39(5):1482-1502. https://doi.org/10.1002/hpm.3820

Zhang, F., Chung, C. K. L., & Yin, Z. (2020). Green infrastructure for China's new urbanisation: A case study of greenway development in Maanshan. *Urban Studies*, *57*(3), 508-524.