DELVE

A MULTIDISCIPLINARY PEER-REVIEWED RESEARCH JOURNAL OF NAGAON UNIVERSITY

August 2026
Vol. X ▪ No. I

Nagaon University

find this journal **online**
https://nagaonuniversity.ac.in/journal_details.php?page=93
ISSN 2278-7402

DELVE

A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University

DELVE is published annually in August by Nagaon University, Nagaon, Assam, India.

ISSN 2278-7402

DELVE is published annually in August by Nagaon University, Nagaon, Assam, India

Volume	Number	Month & Year
X	**I**	**August 2026**

Nagaon University

www.nagaonuniversity.ac.in

Aims and Scope of the Journal

DELVE : A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University is an annual journal published by Nagaon University, Nagaon, Assam, India. The journal is committed to advancing scholarly knowledge across a wide range of academic disciplines, providing a rigorous and inclusive forum for the exchange of ideas among researchers, academics, students, practitioners, and policymakers.

The journal publishes original contributions spanning the sciences, humanities, social sciences, law, education, and economics. It welcomes empirical, theoretical, and applied research that addresses significant questions in these fields. Papers that offer interdisciplinary perspectives or engage with issues of broader social, cultural, economic, or policy relevance are particularly encouraged. Research that reflects the regional context of Northeast India, while contributing to national and international scholarly conversations, is given special consideration.

DELVE accepts original research articles, review articles, case studies, and short communications. All manuscripts undergo a rigorous double-blind peer review process to ensure the highest standards of academic quality and integrity.

For further details, please visit https://nagaonuniversity.ac.in/journal_ details.php?page=93 or contact the editorial team at delvehss@nagaonuniversity.ac.in

EDITORIAL BOARD

CHIEF EDITOR

ASSOCIATE EDITORS

CONTENTS

Volume X | Number I | August 2026

CONTENTS

Volume X | Number I | August 2026

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Efficiency Ranking of Indian Commercial Banks

Shibu Das[1*]

Accepted : 4 June, 2026

Abstract

An efficient banking system ensures the proper implementation of monetary policy and the smooth operation of a country's financial system. Efficiency in the banking sector draws attention both from the academician, customers, investors, and policymakers. The present study is significant because it tries to evaluate the level of efficiency of commercial banks of India by using the Data Envelopment Analysis technique for the financial year 2024–25. The findings of the study show that South Indian Bank Ltd, Bank of India, Kotak Mahindra Bank, Bank of Maharashtra, IDFC First Bank Ltd, ICIC Bank Ltd, HDFC Bank Ltd, and Bandhan Bank were found to be the highest-ranked, whereas Punjab & Sind Bank has been ranked as the lowest-ranking bank. The findings of the study clearly show that the level of efficiency is not similar among the commercial banks during the study period. This paper does not address the identification of the determinants of commercial banking efficiency score, which could be a future scope of research.

*Correspondence :
Email : shibudasau@gmail.com

[1]Department of Commerce
Bihpuria College, Bihpuria, Lakhimpur-784161

Published offline : 7 August 2026

Keywords Bank; DEA; Efficiency; Rank; Variables

Introduction

Banking system occupies a crucial role in the economic development of a nation. In fact, banking system of any nation is the backbone of an economy by facilitating financial intermediation, encouraging investment and saving and further ensuring the smooth working of the money market. Hence, a strong banking system is essential in the modern society for sustaining economic growth (Ahluvaliya, 2002). No doubt, Indian banking sector has emerged as one of the strongest drivers for India's economic growth (Suriyamurthi et. al., 2012). On the other hand, the Indian banking system is one of the most diversified banking systems (Marak and Kar, 2024). Reason is that, the structure of the banking system of India can be broadly divided into scheduled banks, non-scheduled banks and development banks. Presently, 135 scheduled commercial banks are providing banking services in India. In addition, co-operative banks and local area banks are also providing banking services in various segments in different locations of the country (Department of Financial Services).

According to Gulati (2011), an efficient banking system ensures the proper implementation of monetary policy and the smooth operation of a country's financial system. Efficiency in the banking sector draws attention both from the academic fraternity, from customers and from policymakers. The efficiency of the banking sector is an all-encompassing measure that reflects different dimensions of performance and integrates several financial indicators (Wu et al. 2006). Data envelopment analysis (DEA) is applicable in the banking sector and is widely used to measure the level of efficiency in order to provide a reliable basis for decision-making process.

Review of Literature

This section presents a brief review of the literature on the level of efficiency of banks by using DEA technique. The period of review of literature is taken from 2015 to 2024. A number of studies have used DEA to examine the efficiency of banks across different countries. Boďa and Zimková (2015) compared the efficiency of the Slovak banking industry using three different DEA approaches, while Takbiri et al., (2015) conducted a DEA-based analysis on Bank Shahr of Tehran. In the Indian context, Mukta (2016) evaluated the efficiency of Indian public sector banks using DEA. Similarly, Zhou et al., (2018) analysed the efficiency of commercial banks in Ghana. Further, Guru and Mahalik (2020) benchmarked

the performance of public banks in India, highlighting variations in their relative efficiency levels.

In the West Balkan and Serbian banking sectors, several studies have explored DEA applications. Marcikić & Milenković et al. (2022) compared three DEA approaches to evaluate the efficiency of Serbian banks. Marcikić & Radovanov et al., (2022) further analysed the efficiency of the Serbian banking sector using the DEA model. In an emerging economy context, Ullah, Majeed and Popp (2023) investigated the determinants of banking efficiency through a DEA approach. Most recently, Marak and Kar (2024) examined the efficiency of Indian public sector banks using DEA, adding to the growing body of research that applies this technique to measure and compare banking performance globally.

Research Gap

Although numerous studies have measured the efficiency of public sector banks, RRBs, and bank branches in India, very few have attempted to determine the level of efficiency of Commercial Banks in India. Hence, the present study addresses this gap by using the DEA technique to measure the efficiency levels of Commercial Banks in India for the financial year 2024-25.

Significance of the Study

The present study is significant because tries to evaluates the level of efficiency of Commercial Banks of India by using the DEA approach for 2024–25. The study is identifying performance gaps, benchmarking ideal efficiency levels, and providing insights to enhance productivity and decision-making in the Commercial Banking sector.

Objectives

The present study aims to determine the level of efficiency of selected commercial banks in India for the financial year 2024–2025.

Research Question

Are all the selected commercial banks in India equally efficient during the financial year 2024–2025?

What is the efficiency ranking of the selected commercial banks in India for the financial year 2024–2025?

Methodology

Type of study : Theoretical cum empirical in nature.

Type of data : Secondary data.

Sources of data : Various financial reports such as Income Statements and Balance Sheets are used to collect the data.

Population Size : 77 Commercial Banks India (Source: www.rbi.org).

Sample Size: 32 Banks are taken for the present study viz., SBI & Associates, Nationalised Banks & Private Sector Banks in India, Private Banks are excluded from the study because their ownership structure is different.

Period of Study : April 2024- March 2025. Review of literature shows that many studies have been done by taking one financial year, Chanu and Das, 2016; Chanu and Das, 2018a; and Chanu & Das, 2018b has taken one financial year for measuring the bank level efficiency.

Input and Output Variables

In any institutions when measuring the level of efficiency, it requires the input and output variable but selection of those variables is not easy because there are many input and output bundles. According to Berger and Humphrey (1997), there are two main approaches to select the variables. Those are: the production approach and the intermediation approach. In the present study production approach has been used to measure the efficiency and on the basis of this approach following inputs and outputs variables have been chosen.

Interest Expended

Oral and Yolalan, (1990); Paradi and Schaffnit, (2004); Al-Tamimi and Lootah, (2007); Tsolas, (2010), Fethi and pasiouras (2010), Boďa and Zimková (2015) used interest expenses as an input.

Operating Expenses

Camanho and Dyson, (2005); Al-Tamimi and Lootah, (2007); Camanho and Dyson, (2008) used operating expenses as an input in their studies. Therefore, it is taken as an input.

Interest Earned

In the studies of Manandhar and Tang, (2002); Camanho and Dyson, (2005); Pastor et al., (2006); Al-Tamimi and Lootah, (2007); McEachern and Paradi, (2007); Valami, (2009); Lotfi et al., (2010) interest earned is taken as an output. Therefore, it is taken as an output.

Total Deposits

The studies of Camanho and Dyson, (2005); Pastor et al., (2006); Howland and Rowse, (2006); Al-Tamimi and Lootah, (2007); Camanho and Dyson, (2008); Valami, (2009); Lotfi et al., (2010) used deposit as an output. Thus, deposit is considered as an output for this study.

Total Loans and Advances

The studies of Paradi and Schaffnit, (2004); Camanho and Dyson, (2005); Camanho and Dyson, (2006); Al-Tamimi and Lootah, (2007); Lotfi et al., (2010) applied total loans and advances as an output. Thus, another output for the study is total loans and advances.

Data Envelopment Analysis (DEA)

DEA is widely used method to

measure the technical efficiency of any financial organization namely bank. Here, banks are known as Decision Making Unit (DMU). DMU must be homogenous. The performance score of a DMU varies between 0 and 1 and the best performing DMU is assigned a value of one and vice versa.

It is generally acknowledged that the concept of DEA was first introduced into operations research literature by Charnes, Cooper, and Rhodes (CCR) in 1978. Singh (2013) noted that the original CCR model was applicable only to technologies exhibiting constant returns to scale (CRS) globally. In the present study, the CRS assumption has been adopted to measure the efficiency levels of commercial banks, as prior research indicated that most public sector banks operated under constant returns to scale during the study period (Marak & Kar, 2024).

Finding and Analysis

Table 1 : Efficiency Score of Banks

Particulars	Summary of Efficiency Score
No. of DMUs	32
No. of fully efficient Commercials in India	8
No. of Not fully efficient RRBs in India	24
Average	0.934
SD	0.054
Maximum	1.000
Minimum	0.836

Source : Author's calculation

The efficiency of statistical analytical scores presents in Table 1 indicates that out of 32 commercial banks in India, there are 8 banks which are fully efficient and remaining 24 are not fully efficient Banks under the selected data. An efficiency scores equal to 1 means that the banks is fully efficient. It implies that efficient Banks could be minimizing the inputs at given output level depending on the methodology used to estimate the DEA model. Average level of efficiency of banks in the financial year 2024-25 is 0.934; it means inputs variable could

be proportionately reduced without changing the output level on the other hand output could be increased without injecting additional inputs and it also implies that the selected Banks in India are not fully efficient in that selected financial year under the input oriented measured as well output oriented measured. The table also shows that lowest score stands at 0.836.

Table 2 : Individual Efficiency Scores and Ranks of Commercial Banks

Rank	DMU	Efficiency Score	Rank
1	South Indian Bank Ltd	1.000	1
2	Bank of India	1.000	1
3	Kotak Mahindra Bank	1.000	1
4	Bank of Maharastra	1.000	1
5	IDFC First Bank Ltd	1.000	1
6	ICIC Bank Ltd	1.000	1
7	HDFC Bank Ltd	1.000	1
8	Bandhan Bank	1.000	1
9	IDBI Bank Ltd	0.999	9
10	Bank of Boroda	0.982	10
11	Axix Bank	0.976	11
12	Cabada Bank	0.969	12
13	Karur Vysya Bank Ltd	0.958	13
14	Indian Bank	0.951	14
15	Tamilnad Mercantile	0.938	15
16	Jammu & Kashmir Bank	0.937	16
17	CSB Bank	0.929	17
18	Indusind Bank Ltd	0.922	18

19	RBL Bank Ltd	0.909	19
20	Yes Bank Bank Ltd	0.908	20
21	DCB Bank Ltd	0.907	21
22	Federal Bank Ltd	0.906	22
23	Indian Overseas Bank	0.901	23
24	Union Bank of India	0.896	24
25	PNB	0.890	25
26	City Union Bank ltd	0.883	26
27	UCO Bank	0.874	27
28	SBI	0.865	28
29	Central Bank of India (CBI)	0.865	29
30	Nainital Bank Ltd	0.856	30
31	Karnataka Bank Ltd	0.843	31
32	Punjab & Sind Bank	0.836	32

Source : Author's calculation

The Table 4 presents the rank of banks based on their efficiency score. Out of 32 banks, 8 banks which are fully efficient, the table also shows that the South Indian Bank Ltd, Bank of India, Kotak Mahindra Bank, Bank of Maharastra, IDFC First Bank Ltd, ICIC Bank Ltd, HDFC Bank Ltd and Bandhan Bank are the fully efficient banks among 32 selected banks. The score cards show that the fully efficient 8 (eight) banks might use minimum bundle of inputs by earning maximum level of output during the study period. The table also reveals out of 32 banks here, 24 are not fully efficient Banks. Punjab & Sind Bank stands in last among them, it scores 0.836.

Conclusion

The banking sector has the capacity to control and direct other business organisations in terms of monetary supply (Marak and Kar,

2024). The study analyzed the efficiency of Commercial banks of India for the period of 2024-2025. South Indian Bank Ltd, Bank of India, Kotak Mahindra Bank, Bank of Maharashtra, IDFC First Bank Ltd, ICIC Bank Ltd, HDFC Bank Ltd, and Bandhan Bank were found to be the highest rank whereas Punjab & Sind Bank has been ranked as the least ranking bank. The findings of the study clearly show that the level of efficiency is not similar in case of all the Commercial Banks in India during the study period.

The limitations of the present study are mainly associated with the selected methodology. The results of the DEA models depend on the sample size of DMUs and variable bundles. Moreover, DEA has no predictive possibilities and the results remain sensitive to the choice of both DMUs and variables (Horvat et al., 2022). DEA is a relative method and can only measure efficiency in comparison to other DMUs (Horvat et al., 2022). Hence, increasing or decreasing the number of banks in the analysis or selecting different input or output variables may lead to changes in the efficiency scores as well as the results. Furthermore, the present paper does not cover on identifying the determinants of commercial banking efficiency level; this aspect could be explored in future research.

References

Ahluvaliya, M. S. (2002). Economic Reforms in India since 1991, has Gradualism Worked. *Journal of Economic Perspective,* 16(3), 67-88, 2002. Retrieved from https://www.jstor.org/stable/3216951 on 20-10-2025.

Al-Tamimi, H. A. H., & Lootah, A. M. (2007). Evaluating the Operational and Profitability Efficiency of a UAE-Based Commercial Bank. Journal of Financial Services Marketing, 11(4), 333–348. doi: 10.1057/palgrave.fsm.4760043.

Boďa, M., & Zimková, E. (2015). Efficiency in the Slovak banking industry: a comparison of three approaches. Prague Economic Papers, 2015(4), 434-451. https://doi.org/10.18267/j.pep.546.

Berger, A. N., & Humphrey, D. B. (1997). Efficiency of Financial Institutions: International Survey and Directions for Future Research. *European Journal of Operational Research, 98(2)*, 175-212. Retrieved from http://d1c25a6gwz7q5e.cloudfront.net/papers/67.pdf on 29-5-2015.

Chanu, A. I., & Das, S. (2016). A Study on Efficiency of Select Regional Rural Banks in India. *The Indian Journal*

of Commerce, 69(4), 48-59.

Chanu, A. I., & Das, S. (2018a). A Study on Efficiency on Assam Gramin Vikash Bank Branches. *Paripex-Indian* Journal of Research, 7(5), 526-5209.

Chanu, A. I., & Das, S. (2018b). Evaluating the Operational Efficiency of Assam Gramin Vikash Bank Branches. *Journal of Emerging Technologies and Innovative Research, 5(5)*, 837-842.

Charnes, A., Cooper, W. W., & Rhodes, E. (1978). Measuring the Efficiency of Decision Making Units. *European Journal of Operational Research, 2*(6), 429-444. Retrieved from http://www.utdallas.edu/~ryoung/phdseminar/CCR1978.pdf on 1-6-2015.

Camanho, A. S., & Dyson, R. G. (2005). Cost Efficiency, Production and Value-Added Models in the Analysis of Bank branch performance. *The Journal of the Operational Research Society, 56*(5), 483-494. Retrieved from http://www.jstor.org/stable/4102102 on 07/12/2012.

Camanho, A. S., & Dyson, R. G. (2008). A Generalization of the Farrell Cost Efficiency Measure Applicable to Non-Fully Competitive Settings. *Omega, 36(1)*, 147–162. doi:10.1016/j.omega.2005.12.004.

Department of Financial Services. Retrieved from https://financialservices.gov.in/beta/en/banking-overview, on 19-10-2025.

Fethi, M.D., & Pasiouras, F. (2010). Assessing bank efficiency and performance with operational research and artificial intelligence techniques: a survey, *European Journal of Operational Research, 204(2)*, 189-198. http://dx.doi.org/10.1016/j.ejor.2009.08.003.

Gulati, R. (2011). *Efficiency in Indian Commercial Banks : A Post-deregulation Experience.* (Doctoral Dissertation, Guru Nanak Dev University, Amritsar, India). Retrieved from http://shodhganga.inflibnet.ac.in/handle/10603/10226 on 19-2-2016.

Guru, S., & Mahalik, D. K. (2020). Measuring, Benchmarking and ranking the Performance of Indian Public Sector Banks. *SSRN Electronic Journal,* 1-20. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3753725 on 20-10-2025.

Howland, M., & Rowse, J. (2006). Measuring

Bank Branch Efficiency Using Data Envelopment Analysis: Managerial and Implementation Issues. *Information Systems and Operational Research, 44(1)*, 49-63. doi: 10.1080/03155986.2006.11732739.

Kosisova, K. (2015). Application of the DEA on the measurement of efficiency in the EU countries. *Agric. Econ. 61*(2), 51–62.

List of Bak Data. Retrieved from https://www.rbi.org.in/commonPerson/english/scripts/banksinindia.aspx, 18-10-2025

Manandhar, R., & Tang, J. C. S. (2002). The Evaluation of Bank Branch Performance Using Data Envelopment Analysis: A Framework. *Journal of High Technology Management Research, 13(1)*, 1–17. Retrieved from https://www.sciencedirect.com/science/article/pii/S1047831001000451 on 10-8-2015.

Marak, T. R. & Kar, S. (2024). Benchmarking the Performance of Indian Public Sector Banks. *Indian Journal of Commerce, 77(1)*, 1-12.

Marcikić, H. A., Milenković, N., Radovanov, B., Zelenović, V., & Milić, D. (2022). DEA efficiency of Serbian banks-comparison of three approach. Анали Економског факултета у Суботици – The Annals of the Faculty of Economics in Subotica, 59(50), 019-035. http://dx.doi.org/10.5937/AnEkSub2200011M

Marcikić H. A., Radovanov B., Milić D., & Milenković, N. (2022). Efficiency Analysis of Serbian Banking Sector Using Data Envelopment Analysis – Pre-pandemic era. *BizInfo* (Blace), 13(2), 41-47. https://doi.org/10.5937bizinfo/220201M.

McEachern, D., & Paradi, J. C. (2007). Intra - and Inter-Country Bank Branch Assessment Using DEA. *Journal of Productivity Analysis, 27(2)*, 123–136. doi: 10.1007/s11123-006-0029-z.

Oral, M., & Yolalan, R. (1990). An Empirical Study on Measuring Operating Efficiency and Profitability of Bank Branches. *European Journal of Operational Research, 46(3)*, 282-294. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/037722179090002S on 22-5-2016.

Paradi, J. C., & Schaffnit, C. (2004). Commercial Branch Performance Evaluation and Results Communication in

a Canadian Bank - A DEA Application. *European Journal of Operational Research, 156(3)*, 719–735. doi:10.1016/S0377-2217(03)00108-5.

Pastor, J. T., Lovell, C. A. K., & Tulkens, H. (2006). Evaluating the Financial Performance of Bank Branches. *Annals of Operations Research, 145(1)*, 321–337. doi: 10.1007/s10479-006-0038-3.

Suriyamurthi, S., Karthik, R. & Mahalakshmi, V. (2012). Global Practices of Financial Services with Reference to Banking in India. *Advances in Management,* 5(2), 24-28, February 2012.

Singh, H. (2013). *Efficiency of Indian Commercial Banks During Post Reform Period.* (Doctoral Dissertation, Punjabi University, India). Retrieved from http://hdl.handle.net/10603/25862 on 24-05-2015.

Tsolas, I. E. (2010). Modeling Bank Branch Profitability and Effectiveness by Means of DEA. *International Journal of Productivity and Performance Management, 59(5)*, 432–451. doi: 10.1108/17410401011052878.

Takbiri, O., Mohammadi, M. & Naderi, B. (2015). The efficiency of bank branches. *Management Science Letters,* 5, 1111-1116. http://www.growingscience.com/msl/Vol5/msl_2015_101.pdf on 2-8-2016.

Ullah, S., Majeed, A., & Popp, J. (2023). Determinants of bank's efficiency in an emerging economy: A data envelopment analysis approach. *PLoS ONE,* 18(3).

Valami, H. B. (2009). Group Performance Evaluation, an Application of Data Envelopment Analysis. *Journal of Computational and Applied Mathematics, 230(2)*, 485–490. doi:10.1016/j.cam.2008.12.020.

Wu, D., Yang, Z., & Liang, L. (2006). Using DEA-neural Network Approach to Evaluate Branch Efficiency of a Large Canadian bank. *Expert Systems with Applications, 31(1)*, 108–115. doi:10.1016/j.eswa.2005.09.034.

Zhou, Z., Amowine, N., & Huang, D. (2018). Quantitative efficiency assessment based on the dynamic slack-based network data envelopment analysis for commercial banks in Ghana. *South African Journal of Economic and Management Sciences, 21(1)*, https://doi.org/10.4102/sajems.v21i1.1717.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Fiscal Decentralization and Economic Growth in India : A Systematic Review of Evidence, Institutional Mechanisms and Policy Implication

Mokibur Khan[1*]

Accepted : 15 June, 2026

Abstract

This study systematically examines the relationship between fiscal decentralization and economic growth in India using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) based Systematic Literature Review (SLR) approach. India's fiscal federalism framework was established through the 73rd and 74th Constitutional Amendments aims to empower sub national governments through devolution of fiscal authority. However, empirical findings remain inconsistent and context-dependent. Drawing upon global and Indian evidence, this review identifies that expenditure decentralization positively

*Correspondence :
Email: mokiburkhan2000@gmail.com

[1]Department of Economics
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

affects growth in the long term while revenue decentralization exhibits mixed effects moderated by institutional capacity and governance quality. Indian evidence highlights asymmetric and nonlinear relationships where positive fiscal shocks stimulate growth but heighten environmental costs. Persistent challenges including incomplete third-tier devolution, weak municipal finances and soft budget constraints limit the translation of fiscal autonomy into productive outcomes. The paper develops a conceptual framework explaining how institutional quality, fiscal discipline and governance mechanisms mediate decentralization's effects on economic performance. Policy recommendations emphasize strengthening own-source revenues, enforcing hard budget constraints and adopting differentiated decentralization strategies tailored to state-level capacity. The findings underscore that institutional reform, not constitutional design alone, determines decentralization's developmental efficacy.

Keywords Fiscal decentralization; Economic growth; India; Fiscal federalism; Institutional quality; Systematic literature review

Introduction

India's constitutional framework established a three-tier governance system through the 73rd and 74th Constitutional Amendment Acts of 1992, which devolved fiscal responsibilities to state and local governments (Bhutani et al., 2020). These amendments created a constitutional mandate for Panchayati Raj Institutions in rural areas and Urban Local Bodies in urban areas, granting them constitutional status and requiring states to delegate powers and responsibilities for planning and service delivery (Malik et al., 2025). Fiscal decentralization encompasses both revenue assignments and expenditure responsibilities, requiring examination of how financial authority distribution affects macroeconomic outcomes. However, despite the revolutionary intent of these amendments, the resulting system created what scholars term "guided" or "dependent fiscal federalism," wherein local governments remain substantially dependent on higher levels of government for financial resources and policy direction (Yadav, 2025).

The relationship between fiscal decentralization and economic growth remains theoretically contentious and empirically contested (Neupane, 2024). While fiscal federalism theoretically improves governance quality and service efficiency by enabling local governments to tailor services to

community needs, empirical evidence from India reveals mixed and non-linear relationships that vary across states and institutional contexts (Br et al., 2023). Studies demonstrates that expenditure decentralization has asymmetric long-term and short-term consequences on economic growth and environmental outcomes, with positive and negative shocks producing contrasting effects across different Indian states (Hanif et al., 2020). The effectiveness of fiscal decentralization depends substantially on institutional quality, governance frameworks, and the capacity of local authorities to manage devolved resources, creating significant heterogeneity in implementation outcomes across India's federal structure.

The main objective of this study is to make a systematic review of the scholarly studies for examining India's experience with fiscal decentralization which is characterized by incomplete devolution to local bodies, state-level heterogeneity in implementation and asymmetric effects on growth and environmental outcomes. Understanding these mechanisms is critical for policy formulation in India's federal structure, particularly given the persistence of fiscal deficits at the local level despite constitutional guarantees of devolved authority.

This paper uses the Systematic Literature Review (SLR) method with a qualitative approach to explore the effect of fiscal decentralization on economic growth in India. SLR is a systematic and structured approach which is used to identify, assess, and synthesize various relevant research results. Through this method, researchers can explore various perspectives and findings that have existed in previous literature, resulting in a more comprehensive understanding of the topic being studied. The method used is PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) as the main standard in the SLR process. PRISMA is used to ensure that the stages of article selection and literature synthesis are carried out transparently, systematically, and can be replicated. By following this method, each step in the research process can be well documented, so that subsequent researchers can understand and develop this study consistently.

Theoretical Framework and Measurement of Fiscal Decentralization

The Traditional theory first developed by Oates (1972), and the public choice theory on the role of fiscal decentralisation. Bardhan and Mookherjee (2003) argued that expenditure decentralisation not accompanied by revenue decentralisation

limits the expansionary effect of decentralisation on service levels. Thus fiscal decentralisation is expected to contribute to overall economic growth. The rationale behind this is that decentralising fiscal authorities create a competitive environment among sub-national entities, leading to efficiency and overall economic growth. On the other hand, public Choice emphasises the role of decentralisation as a mechanism to control an intrusive, expansive public sector and to support effective private markets (Weingast, 1995; McKinnon, 1997). Oates' (1972) decentralisation theory refers to the fact that the unit of government closest to its citizens can best direct and adjust its consumption to local preferences and thus provide the public services that meet the needs of its residents. For local governments to be autonomous they should have the power and the right to raise their own revenues, i.e., they must be able to set the tax rates and bases for those revenues they collect (Grdinić et al., 2019). This is the essence of fiscal decentralisation (Ebel & Yilmaz, 2002).

Measuring fiscal decentralization requires employing multiple quantitative indicators to capture the multidimensional nature of authority distribution. Standard measurement approaches include the ratio of sub-national government revenues to total government revenues, expenditure as a percentage of Gross Domestic Product, own-source revenue ratios, and autonomy indicators that capture decision-making discretion (Bhutani & Mishra, 2018). These indicators reveal critical variations across Indian urban and rural tiers. Urban Local Bodies remain substantially dependent on central and state transfers, with limited own-source revenue generation capacity that averages below 10 percent across most municipalities (Bhutani & Mishra, 2018). This incomplete fiscal decentralization at the municipal tier reflects a fundamental disconnect between constitutional provisions for devolution and actual fiscal autonomy: while urban governments exercise expenditure responsibilities for essential services including water supply, sanitation, and public health, they lack the revenue bases necessary for autonomous financing. The resulting fiscal dependence perpetuates what scholars term "guided" or "dependent fiscal federalism," wherein local authorities function as implementing agencies for centrally-determined mandates rather than autonomous governance units (Yadav, 2025).

Impact of Fiscal Decentralization on Economic Growth in a Global Context

The empirical evidence of cross-country studies is not in consensus of

either a positive or negative association of fiscal decentralization with economic growth. In an early study, Davodi & Zou (1998) found different outcomes for developing and developed countries. The study covered 64 countries for the period 1970-1989 and the major finding from the panel regression analysis found no relationship between decentralization and growth for developed countries and negative association for developing countries. The findings of Thiessen(2003)were also on the same track that higher degree of decentralization can affect growth negatively. The study was conducted on high income OECD countries and it showed that countries with moderate level of decentralization gained much from decentralization than the countries with high (low) level of decentralization. This suggests a inverted-U shaped relationship of decentralization and economic growth, i.e. both extreme centralization and decentralization constraints growth indicating a hump-shaped relationship. However, contradictory evidence were found by Rodríguez-Pose & Ezcurra(2011) asserting a negative association without any trace of a hump-shaped relation. Gemmell et al. (2013) found positive impact of revenue decentralization in OECD countries whereas spending decentralization significantly reduces growth. In a more recent study (Canavire-Bacarreza et al.(2020) found that after addressing the endogeneity problem between decentralization and economic growth both revenue and expenditure decentralization has positive impact on economic growth for OECD countries and insignificant impact for non-OECD countries. In most studies the issue of endogeneity was not addressed except for a selected few that used initial income or lagged values of growth to address the endogeneity issue(Davoodi & Zou, 1998; Ligthart & Oudheusden, 2017; Rodríguez-Pose & Ezcurra, 2011). Neyapti (2006) conducted a panel analysis across countries to identify the impact of revenue decentralization on income distribution. The result of the study showed that in the presence of good governance (indicated by variables like control of corruption, rule of law, political stability etc), revenue decentralization has positive effect on income distribution and thus income equality.

Empirical Evidence on Fiscal Decentralization and Economic Growth in India

An empirical study conducted by Zhang and Zou (1997) covered 16 major states of India for the period 1970-1994.

The panel regression analysis suggested that fiscal decentralization has significant positive impact on regional economic growth. Thimmaiah (2000) examined the impact of revenue and expenditure decentralization on growth in India to the state level covering the period of 1985-86 to 1996-97. The results of the regression analysis suggested that though revenue decentralization indicated by the ratio of state government's revenue to total revenue was impacting the level of PCI, expenditure decentralization was not significant in influencing the level of growth. Kaliranjan & Otsuka (2012) indicated in their study that the federal structure helped India to achieve growth, and human development. Panel data studies examining 14 non-specialized Indian states from 1981-2014 provide foundational evidence for understanding fiscal decentralization-growth relationships. Using cointegration and dynamic ordinary least squares frameworks, researchers found that expenditure decentralization has a positive and significant impact on state domestic product, supporting what has been termed the divergence hypothesis in contrast to Oates' convergence hypothesis (Ganaie et al., 2018). This asymmetric pattern reveals that spending decentralization, when controlled by subnational governments, correlates with enhanced regional economic performance. Complementary research employing fixed effects panel models with Driscoll and Kraay standard errors for the same 14 large states from 1981-1982 to 2015-2016 confirms that decentralization Granger-caused economic growth, with reverse causality effects remaining insignificant (Xavier et al., 2021). Capital expenditure and social spending demonstrated significant positive impacts on growth, with states exhibiting high decentralization levels also achieving elevated per capita income levels. These findings establish that expenditure decentralization exhibits substantive growth-promoting effects at the state level, though mechanisms vary across spending categories.

Analyses employing state-level data through 1980-2005 reveal nonlinear relationships where fiscal decentralization produces threshold effects on economic growth. Initial research demonstrated that beyond a certain decentralization threshold, typically between 18-25 percent of revenue decentralization ratios, increases in fiscal authority transfer to subnational units correlate with enhanced growth (Ying-hua, 2022). The 1991 economic reforms period marked a critical institutional transition during which fiscal decentralization effects became

more pronounced across states, though state-specific governance quality and institutional capacity moderated these effects substantially. States with stronger administrative capacity and revenue mobilization capabilities realized more substantial growth benefits from devolved fiscal authority compared to fiscally weaker states, indicating that institutional complementarities determine decentralization effectiveness. This institutional heterogeneity persists across the post-reform period, suggesting that formal fiscal devolution alone generates insufficient economic stimulus without accompanying improvements in local governance quality and resource management capacity.

Recent asymmetric autoregressive distributed lag (ARDL) and nonlinear ARDL modeling techniques applied to Indian data from 1996-2021 reveal sophisticated transmission mechanisms through which fiscal decentralization affects both economic growth and environmental quality (Br et al., 2023). Positive and negative shocks in expenditure decentralization produce contrasting effects: positive expenditure shocks enhance growth in the long term while simultaneously increasing carbon emissions, whereas negative expenditure shocks reduce both growth and emissions, indicating complementary but distinct channels of influence. Revenue decentralization demonstrates symmetric effects across positive and negative shocks, with both configurations contributing to reduced carbon emissions across short-term and long-term horizons. This asymmetric pattern implies that expansionary decentralization policies may generate growth benefits at environmental costs, requiring policy coordination between fiscal and environmental objectives. The presence of asymmetric relationships contradicts linear panel models and reveals nonlinear dynamics that aggregate-level analyses frequently obscure, underscoring the necessity for regime-dependent and shock-specific policy considerations.

Key Findings from Indian-Specific Studies on Fiscal Decentralization Impacts

Mechanisms of Impact: Institutional, Administrative, and Governance Factors

The effectiveness of fiscal decentralization in driving economic growth fundamentally depends on institutional features and governance quality that condition how devolved fiscal authority translates into productive economic outcomes. Hard budget constraints and fiscal autonomy represent critical institutional mechanisms

that mediate decentralization-growth relationships. Research examining India's fiscal federalism reveals that high dependence on tax-sharing mechanisms and soft budget constraints substantially undermine growth impacts (Sindhu et al., 2016). States exhibiting constrained own-source revenue capacity and reliance on central government transfers lack the fiscal discipline necessary to allocate resources toward productive investments, instead deploying budgets reactively to meet mandated spending requirements. This pattern reveals how nominal fiscal decentralization divorced from genuine autonomy becomes purely administrative, failing to activate the allocative efficiency mechanisms theoretically expected from expanded local decision-making authority.

Governance quality and institutional capacity substantially moderate whether fiscal decentralization produces growth benefits or reverses them through misallocation and inefficiency (Neupane, 2024). State governments' capacity to raise own-source revenues, manage expenditures efficiently, and implement development initiatives varies considerably across India's federal structure, with administrative capacity emerging as a critical determinant of decentralization effectiveness. Weaker institutional environments frequently eliminate potential growth benefits of fiscal autonomy when subnational governments lack technical expertise, financial management systems, and organizational infrastructure necessary for resource deployment. Paradoxically, soft constraints and central government intervention positively correlate with state economic growth in capacity-constrained regions, suggesting that excessive decentralization without commensurate capacity development may prove counterproductive (Sindhu et al., 2016). This counterintuitive finding indicates that states benefit from coordinated central intervention when local capacity constraints bind, particularly in less developed regions where administrative systems remain nascent. The relationship thus exhibits non-monotonic characteristics wherein intermediate decentralization levels produce optimal outcomes by balancing local responsiveness against the need for technical guidance and institutional oversight.

Capital expenditure allocation and efficiency ratios significantly mediate fiscal decentralization-growth relationships, revealing that decentralization benefits depend fundamentally on how local governments deploy available resources (Munawwarah et al., 2025). Fiscal decentralization's

positive effects emerge prominently when local governments prioritize productive capital expenditures over consumption spending, with efficiency and effectiveness in resource utilization determining actual growth outcomes. Independence variables measuring own-revenue generation capacity paradoxically demonstrate negative effects when decoupled from expenditure efficiency, indicating that fiscal autonomy generates growth benefits only when accompanied by institutional capacity and strategic resource allocation frameworks. These findings collectively emphasize that institutional complementarities encompassing governance quality, administrative capacity, budget discipline mechanisms, and strategic expenditure management determine whether formal fiscal devolution translates into enhanced regional economic performance.

Heterogeneous Effects : Inter-State Dynamics and Growth Outcomes of Fiscal Decentralization in India

Panel data studies covering 14 major Indian states between 1981 and 2014 provide foundational evidence that expenditure decentralization significantly enhances economic growth. Expenditure autonomy positively influences the State Domestic Product, validating the divergence hypothesis, wherein decentralized fiscal control fosters regional growth disparities due to differential capacity levels (Ganaie et al., 2018). Further evidence from fixed-effects models with Driscoll and Kraay standard errors during 1981–2016 confirms that fiscal decentralization Granger-causes economic growth, with capital expenditure and social spending emerging as significant positive determinants of state-level performance (Xavier et al., 2021). The long-run relationship between fiscal decentralization and growth is also supported by cointegration tests, while threshold regressions reveal that the growth impact becomes positive only when the revenue decentralization ratio exceeds the 18–25 percent threshold (Ying-hua, 2022). The post-1991 liberalization period marks a structural break, enhancing the fiscal autonomy of subnational governments but revealing that states with stronger institutional and administrative capacities gain more pronounced benefits.

The asymmetric and nonlinear nature of the fiscal decentralization and growth relationship is evident in recent analyses employing ARDL and NARDL models using Indian data from 1996 to 2021. Positive shocks in expenditure decentralization enhance long-term growth but increase carbon emissions, while negative expenditure shocks reduce both economic growth and emissions (Br

et al., 2023). Revenue decentralization demonstrates symmetric effects that consistently reduce emissions over both short and long horizons, suggesting that environmental outcomes are sensitive to the type of fiscal decentralization. These findings imply that fiscal decentralization policies must balance growth objectives with environmental sustainability, recognizing the asymmetric responses of the economy to fiscal shocks.

At the subnational level, significant heterogeneity characterizes the decentralization–growth relationship. Variations in Gross State Domestic Product (GSDP), institutional quality, and sectoral structure across states contribute to differing growth responses. Wealthier states with higher institutional quality indices such as Kerala, Maharashtra, Tamil Nadu, and Delhi register strong positive elasticity between revenue decentralization and growth, whereas fiscally weaker states such as Bihar, Uttar Pradesh, and Odisha display limited responsiveness (Agarwal, 2019; de Xavier et al., 2021). Sectoral evidence shows that fiscal decentralization primarily benefits the industrial and service sectors through improved infrastructure provision and targeted investment, while the agricultural sector exhibits muted growth responses. This pattern reflects that the benefits of fiscal decentralization depend heavily on state-level economic composition and institutional readiness (de Xavier et al., 2021).

Constraints and Implementation Challenges in India's Fiscal Decentralization and a Conceptual Framework for Policy Integration

Structural Constraints in Urban Local Government Finance

Urban Local Bodies in India confront acute structural constraints that fundamentally undermine fiscal decentralization effectiveness, despite the 74th Constitutional Amendment's explicit provisions for municipal autonomy and devolution. The core challenge centers on inadequate own-source revenue generation capacity, with property tax collection mechanisms remaining chronically underfunded and administratively deficient. Municipal corporations across India struggle to mobilize revenues despite substantial informal sectors employing approximately 80 percent of urban workforces (Musthaf, 2025), which contribute minimally to municipal coffers due to outdated tax administration systems, complex licensing procedures, and political interference in revenue collection (Musthaf, 2025). This structural revenue constraint persists despite significant

untapped fiscal potential. This acute disconnect reveals that constitutional devolution of spending responsibilities to municipalities remains nominal when accompanied by restricted revenue-raising authority, creating what scholars characterize as fiscal decentralization divorced from genuine autonomy. The resulting dependence on central and state government transfers constituting 90 percent or more of municipal revenues across most corporations fundamentally constrains local governments' capacity to exercise meaningful discretion in resource allocation or respond to community-specific priorities.

The Incompleteness of Third-Tier Devolution

The third tier of governance comprising both urban Local Bodies and rural Panchayati Raj Institutions experiences systematic fiscal stress relative to constitutionally-assigned expenditure responsibilities, creating what scholars characterize as incomplete decentralization. Both institutional layers face systematically lower budgetary allocations and more severely constrained fiscal bases than their constitutional mandates would suggest (Bhutani & Mishra, 2018). This incompleteness manifests in the critical gap between assigned functions and available financial resources: local governments bear responsibility for essential services including water supply, sanitation, waste management, local roads, and basic healthcare, yet lack resources sufficient for adequate service provision across expanding urban and rural populations (Bandyopadhyay & Rao, 2009). Revenue bases remain fundamentally limited due to restricted access to productive tax instruments; while rural panchayats lack commercial tax bases entirely, urban municipalities theoretically possess property tax potential yet extract minimal revenues due to administrative constraints and political resistance to tax enhancement. States systematically restrict local revenue mobilization through regulatory constraints, preferring continued fiscal dependence that preserves state government leverage over local spending priorities. This structural configuration reveals how constitutional guarantees of fiscal devolution transform into symbolic gestures when implementation remains incomplete: local governments function as executing agencies for centrally-mandated spending programs rather than autonomous entities capable of setting independent development priorities. The resulting fiscal stress directly constrains service delivery quality and institutional capacity development, creating vicious cycles wherein underfunded local

institutions cannot build administrative capability necessary for enhanced revenue mobilization.

Governance Quality and Corruption-Decentralization Dynamics

The relationship between fiscal decentralization and corruption exhibits fragile and conditional characteristics that render decentralization potentially counterproductive when institutional safeguards remain weak. Research examining Indian state governance demonstrates that fiscal decentralization correlates negatively with corruption levels overall, suggesting that enhanced local accountability and governance reduces rent-seeking opportunities (Charron & Charron, 2010). However, this beneficial relationship deteriorates substantially in regions characterized by low development levels and inadequate institutional frameworks, where increased fiscal autonomy paradoxically facilitates enhanced corruption rather than reducing it (Charron & Charron, 2010). Fiscal decentralization in low-capacity environments provides expanded opportunities for rent-seeking behavior when institutional checks, independent auditing mechanisms, and participatory governance structures remain nascent. The mechanism operates through multiple channels: decentralized decision-making authority increases discretionary spending opportunities that poorly-monitored local officials exploit for personal enrichment, while weak transparency mechanisms prevent citizen oversight of resource deployment. This pattern emphasizes that anti-corruption benefits of decentralization remain contingent upon accompanying institutional development in governance accountability, administrative transparency, and civic engagement. Decentralization without complementary institutional strengthening may generate growth through enhanced responsiveness but simultaneously create corruption opportunities that offset efficiency gains through resource misappropriation and service quality degradation.

Revenue-Expenditure Imbalances and Soft Budget Constraints

Structural imbalances between revenue and expenditure assignments create perverse fiscal incentives that systematically undermine the accountability and productivity mechanisms through which decentralization theoretically enhances economic growth. States demonstrate negative correlations between own-tax revenue ratios and Gross State Domestic Product growth rates, indicating that reliance on internally-generated revenues paradoxically constrains growth when combined with soft budget constraints (Sindhu et al.,

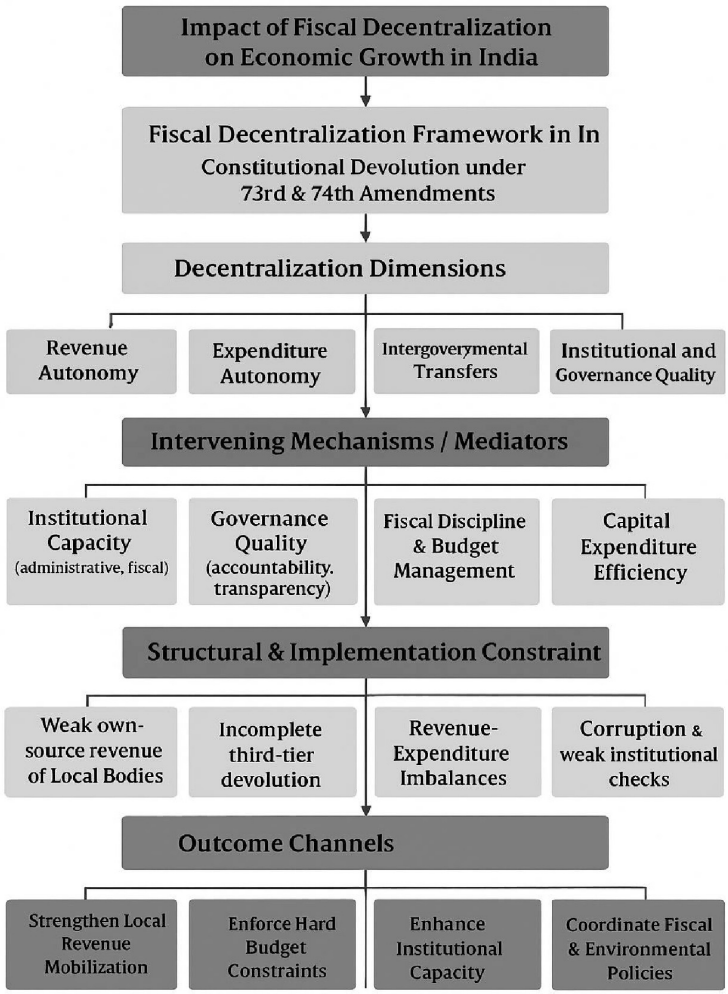

Figure 1: Conceptual Framework of the Impact of Fiscal Decentralization on Economic Growth in India. *Source : Authors' conceptualization*

2016). This counterintuitive finding reflects the dynamics of soft budget constraint systems wherein central government bailouts remain implicit: states exhibiting high own-revenue dependence simultaneously face political pressure to deliver expanded services, generating structural fiscal deficits that central governments ultimately accommodate through discretionary transfers and debt accumulation (Sindhu et al., 2016). These soft constraints eliminate the fiscal discipline necessary for productive resource allocation, as

subnational governments lack incentives to prioritize efficiency gains or eliminate wasteful spending when deficits trigger automatic central government intervention. The resulting incentive structure encourages rent-seeking and fiscal profligacy: state governments expand current consumption spending rather than capital investment, knowing that central bailouts will eventually address expenditure pressures. Central government intervention, paradoxically, positively correlates with state economic growth in resource-constrained regions, suggesting that capacity-limited states benefit from continued central guidance despite theoretical decentralization mandates (Sindhu et al., 2016). This configuration reveals how nominal fiscal federalism coexists with substantive fiscal centralization when transfer mechanisms accommodate persistent deficits without enforcing budget discipline. The long-term consequence involves systematic deterioration in fiscal capacity and institutional accountability as subnational governments develop expectational relationships with central authorities rather than internalizing fiscal responsibility and revenue mobilization obligations.

Policy Implications and Recommendations for Effective Fiscal Decentralization

India's mixed experience with fiscal decentralization reveals that formal constitutional devolution without accompanying institutional and fiscal reforms fails to generate growth benefits or improve service delivery outcomes. Translating theoretical decentralization benefits into practical governance improvements requires comprehensive policy interventions addressing revenue generation, institutional quality, intergovernmental transfer mechanisms, and heterogeneous implementation strategies across state contexts.

Strengthening own-revenue generating capacity at subnational levels represents the foundational prerequisite for realizing fiscal decentralization benefits, requiring systematic property tax reforms and expanded revenue source assignments to local governments (Bhutani et al., 2020). India's municipal corporations confront acute revenue mobilization deficits, with property tax collection mechanisms remaining chronically underfunded despite substantial untapped fiscal potential in the informal sector employing approximately 80 percent of urban workforces (Musthaf, 2025). Finance Commission recommendations should

prioritize comprehensive property tax administration reforms including digital governance tools, streamlined regulatory procedures, and modernized tax assessment systems that evidence from pioneering cities demonstrates can boost collection efficiency by 20-25 percent (Musthaf, 2025). Beyond property tax enhancement, Finance Commissions should mandate assignment of additional productive revenue sources to local governments rather than expanding transfer dependence that perpetuates fiscal subordination. Municipal corporations require access to buoyant revenue instruments aligned with urban economic growth patterns, as current transfer mechanisms provide insufficient fiscal stability for essential service delivery or autonomous decision-making (Bandyopadhyay & Rao, 2009).

Institutional reforms must precede or accompany fiscal decentralization to establish governance quality foundations capable of supporting autonomous decision-making and accountability (Neupane, 2024). Hard budget constraints that enforce fiscal discipline prove critical for generating productive resource allocation rather than consumption-oriented spending, while transparent accounting systems and performance-based evaluation mechanisms create accountability structures that enhance efficiency and reduce rent-seeking opportunities. Research demonstrates that increased fiscal autonomy generates growth benefits only when institutional checks, independent auditing mechanisms, and participatory governance structures simultaneously develop, preventing fiscal decentralization from facilitating corruption in low-capacity environments. States must implement complementary institutional strengthening including administrative capacity development, financial management systems modernization, and civic participation mechanisms that enable subnational governments to exercise devolved authority productively..

Differentiated decentralization strategies accounting for state heterogeneity and institutional capacity variations must replace uniform national approaches that ignore fundamental state-level differences in development levels, administrative capacity, and economic composition (Ying-hua, 2022). Optimal decentralization levels vary substantially across Indian states: wealthier states with established administrative systems and diversified service sectors realize more substantial growth benefits from fiscal authority transfer, while less developed states with weak institutional capacity and limited

revenue bases require calibrated, phased approaches combining decentralization with sustained capacity building. Policy frameworks should recognize that Kerala and Maharashtra's higher decentralization levels remain optimal for their institutional contexts, while states such as Bihar and Odisha require intermediate decentralization combined with continued central oversight to prevent fiscal mismanagement. Reform strategies must distinguish between geographic regions, development levels, and sectoral compositions rather than applying standardized decentralization templates, ensuring that institutional capacity constraints are addressed before substantial fiscal authority transfers expand opportunities for misallocation or corruption.

Conclusion

Fiscal decentralization's relationship with economic growth in India remains profoundly context-dependent, conditioned by institutional quality, governance capacity, and sector composition rather than reflecting uniform causal mechanisms (Neupane, 2024). The accumulated evidence refutes both strong decentralization advocates and categorical opponents, demonstrating instead that well-designed, appropriately calibrated decentralization can enhance growth when complementary institutional reforms materialize simultaneously. India's mixed empirical outcomes reflect broader South Asian patterns wherein institutional development, not merely formal fiscal devolution, fundamentally determines whether decentralization translates into productive growth or facilitates misallocation and rent-seeking. Future policy design must recognize this complexity by moving beyond standardized constitutional frameworks toward differentiated implementation strategies acknowledging state-level heterogeneity in capacity and development levels.

India's incomplete fiscal decentralization particularly at municipal and rural governance tiers constrains potential growth benefits, as local governments remain substantially lacking financial autonomy despite formal constitutional recognition (Bhutani et al., 2020). Urban Local Bodies confront acute revenue mobilization deficits while simultaneously bearing responsibility for essential service delivery, creating structural fiscal stress that perpetuates transfer dependence and undermines autonomous decision-making. Rural panchayats similarly lack productive revenue bases and remain constrained by soft budget mechanisms that eliminate

fiscal discipline necessary for efficient resource allocation. Comprehensive implementation of genuine devolution remains necessary, extending far beyond state governments to truly empower third-tier institutions through both revenue assignment reform and institutional capacity development. Without addressing these implementation gaps between constitutional provisions and fiscal reality, formal decentralization structures will continue generating limited growth benefits while potentially exacerbating inequality and corruption in capacity-constrained regions.

Scope for Further Research

Future research should prioritize longitudinal analysis of institutional capacity development accompanying decentralization reforms, examining how governance quality improvements enable productive utilization of devolved fiscal authority (Br et al., 2023). Empirical investigation of optimal decentralization levels by state development stage, sectoral composition, and administrative capacity would inform more nuanced policy calibration than current uniform approaches permit. Study should explicitly investigate environmental-growth-decentralization interactions, particularly how positive expenditure shocks generate growth benefits at environmental costs, requiring complementary mitigation strategies. Understanding specific governance reforms including hard budget constraint implementation, transparent financial management systems, and citizen accountability mechanisms that enhance decentralization effectiveness should inform evidence-based policy design beyond current generic recommendations. Such context-specific, capacity-aware research would enable policymakers to design decentralization strategies reflecting India's federal complexity while maximizing growth potential through institutional complementarities rather than formal authority transfer alone.

References

Bandyopadhyay, S., & Rao, M. G. (2009). Fiscal health of selected urban local bodies in India: A study for the Twelfth Finance Commission. National Institute of Public Finance and Policy.

Bardhan, P., & Mookherjee, D. (2003). D*ecentralization and accountability in infrastructure delivery in developing countries.* (Working Paper). Institute for Economic Development, Boston University.

Bhutani, S., & Mishra, R. (2018). Fiscal decentralization and urban local

governance in India: Trends and challenges. *Indian Journal of Public Administration, 64(3)*, 432–449.

Bhutani, S., Mishra, R., & Das, A. (2020). Fiscal decentralization and local governance: Lessons from India's constitutional amendments. *Public Finance and Policy Review, 2(1)*, 45–63.

Br, A., Singh, R., & Kaur, P. (2023). Fiscal decentralization, economic growth and environmental quality in India: Evidence from asymmetric ARDL models. *Environmental Economics and Policy Studies, 25(4)*

Brueckner, J. K. (2006). Fiscal federalism and economic growth. *Journal of Public Economics, 90(10-11)*, 2107–2120.

Canavire-Bacarreza, G., Martinez-Vazquez, J., & Yedgenov, B. (2020). Identifying and disentangling the impact of fiscal decentralization on economic growth. *World Development, 127*

Charron, N., & Charron, M. (2010). Decentralization and corruption: Evidence from Indian states. *Journal of Development Studies, 46(8)*, 1243–1260.

Davoodi, H., & Zou, H. (1998). Fiscal decentralization and economic growth: A cross-country study. *Journal of Urban Economics, 43(2)*, 244–257.

Ebel, R. D., & Yilmaz, S. (2002). *On the measurement and impact of fiscal decentralization*. The World Bank.

Ganaie, A. A., Bhat, S. A., Kamaiah, B., & Khan, N. A. (2018). Fiscal decentralization and economic growth: Evidence from Indian States. *South Asian Journal of Macroeconomics and Public Finance, 7(1)*, 83–108.

Gemmell, N., Kneller, R., & Sanz, I. (2013). Fiscal decentralization and economic growth: Spending versus revenue decentralization. *Economic Inquiry, 51*(4), 1915–1931Grdinić, M., Letina, S., & Barišić, P. (2019). *Theoretical aspects of fiscal decentralization*. University of Zagreb.

Gupta, V., & Khaire, R. (2024). Fiscal decentralization and local fiscal deficits in India: Evidence from state and municipal budgets. *Indian Journal of Economics and Development, 20*(2), 101–118.

Hanif, M., Verma, S., & Sharma, A. (2020). Fiscal decentralization and environmental sustainability: Empirical insights from Indian states. *Environment, Development and Sustainability, 22*(7), 6163–6184.

Jin, J., Qian, Y., & Weingast, B. R. (2020). Institutional foundations of China's and India's fiscal federalism. *World*

Development, 136, 105095.

Kalirajan, K., & Otsuka, K. (2012). Fiscal decentralization and development outcomes in India: An exploratory analysis. *World Development, 40*(8), 1511–1513.

Malik, R., Kumar, S., & Dey, P. (2025). Panchayati Raj and urban local bodies in India: Thirty years of fiscal decentralization. *Indian Journal of Public Policy, 12*(1), 25–46.

McKinnon, R. I. (1997). *EMU as a device for collective fiscal retrenchment. American Economic Review, 87*(2), 227–229.

Munawwarah, N., Pradhan, R., & Kumar, D. (2025). Capital expenditure efficiency and fiscal decentralization: Evidence from Indian states. *Asian Economic Journal, 39*(1), 56–80.

Musthaf, A. (2025). Urban fiscal crisis and property taxation in India: Rethinking municipal finance reforms. *Journal of Urban Affairs, 47*(2), 277–298.

Neupane, R. (2024). Fiscal decentralization and economic growth: A systematic review of evidence from developing economies. *Journal of Public Economics and Policy, 7*(3), 211–239.

Neyapti, B. (2006). Revenue decentralization and income distribution. *Economics Letters, 92*(3), 409–416.

Oates, W. E. (1972). *Fiscal federalism*. Harcourt Brace Jovanovich.

Oates, W. E. (1999). An essay on fiscal federalism. *Journal of Economic Literature, 37*(3), 1120–1149.

Rodríguez-Pose, A., & Ezcurra, R. (2011). Is fiscal decentralization harmful for economic growth? Evidence from the OECD countries. *Journal of Economic Geography, 11*(4), 619–643.

Sindhu, K. P., Sharma, S., & Bhattacharya, M. (2016). Soft budget constraints and fiscal performance of Indian states: Implications for fiscal decentralization. *Economic and Political Weekly, 51*(39), 64–72.

Thiessen, U. (2003). Fiscal decentralisation and economic growth in high-income OECD Countries. *Fiscal Studies, 24*(3), 237–274.

Thimmaiah, G. (2000). Decentralization and economic development: Indian experience. *Hitotsubashi Journal of Economics, 41*(2), 123–136.

Weingast, B. R. (1995). The economic role of political institutions: Market-preserving federalism and economic development. *Journal of Law, Economics, & Organization, 11*(1), 1–31.

Xavier, F., Rao, D. M., & Joshi, A. (2021). Fiscal decentralization and economic growth in Indian states: A panel data analysis. *South Asian Economic Journal, 22*(2), 250–272

Yadav, P. (2025). Dependent fiscal federalism in India: The paradox of devolution and dependence. *Journal of Fiscal Studies, 18*(1), 33–52.

Ying-hua, L. (2022). Fiscal decentralization thresholds and state-level economic growth in India: Evidence from a nonlinear analysis. *Economic Change and Restructuring, 55*(3), 987–1009

Zhang, T., & Zou, H. (1997). Fiscal decentralization, the composition of public spending, and regional growth in India. *Development Research Group Working Paper.* The World Bank.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Nexus between Rural Empowerment and Health Outcomes in India

Arju Ahmed Boruah[1] and Nibedita Goswami[1*]

Accepted : 30 June, 2026

Abstract

India is a developing nation where the rural sector plays a significant role in the country's economy and makes up more than 25% of the GDP. For India's overall growth, improving healthcare services is crucial because quality of healthcare services is an important measure of human development. Nowadays the relevance of healthcare services and their economic importance is generally recognized and so the topic of rural health care and empowerment has emerged as a critical concern but still not much work has been done on the connection between health and empowerment. This paper aims to explore the connection between the upgradation of the healthcare sector and rural empowerment across Indian states using secondary data collected from various published sources like Rural Health Statistics 2021–22(Ministry of Health and Family Welfare), NFHS, journals,

*Correspondence :
Email: nibeditagoswami.rw@gmail.com

[1]Department of Economics
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

etc. Depending on the availability of data, 22 Indian states are chosen for the study along with a number of health indicators such as Infant Mortality Rate (IMR), Under 5 Mortality Rate (U5MR), Crude Birth Rate (CBR), Crude Death Rate (CDR) Per Capita Primary Health center (PCPHC), Per Capita Sub Centers (PCSC) and Per Capita National Rural Health Mission Expenditure (PCNRHME). These indicators not only reflect the health status but also work as a key indicator of rural empowerment. A linear regression model will be used to determine the association between upgradation of healthcare and empowerment.

Keywords Health sectors; Rural health infrastructure; Rural empowerment; Health expenditure

Introduction

The health of the people of a nation is an essential component in its development since it has a direct effect on the country's overall development. Poor health can lead to unemployment and poverty (Sen, 1999). The majority of people in rural India still rely on the public health sector for health care. Therefore, development of the public health sector in rural areas is crucial and government spending is the primary source of development for this sector. Investment in healthcare services considerably determines health outcomes (Grossman, 1972; Laporte,2015). To fulfill the needs of rural areas, NRHM has been providing funds for India's rural public health sector since 2005.

Rural health and empowerment are mutually exclusive. Access to high-quality healthcare services is a critical component of rural empowerment. When rural residents have better health outcomes and access to healthcare, it can lead to many forms of empowerment. Empowerment including control over decision making (Gollub 2000; Kabeer 1999); ability (agency) to formulate strategic choices and to control resources required to achieve a desired outcome (Alsop and Heinsohn 2005; Kabeer 1999; Malhotra et al. 2002; Sen 1990); and having the power to be able to attain desired outcomes (Grown, Gupta, and Pande 2005; Laverack 2006; Sen 1988). Empowerment is also seen as the ability, based on education and skills development, to advocate for improved quality of life (Sen 1990).

Despite tremendous economic expansion over the last three decades, India has seen remarkably slow increases in its population's average health indicators. As a consequence, India's

performance in key health indices is worse than would be estimated based on its economic level. (Barenberg, Basu & Soylu, 2017)

Since India's independence in 1947, government spending on health has been inadequate. The government pays only 17% of total health-care costs. Rest is borne privately by the people in an unsatisfactory health-care system with insufficient infrastructure. (Kumar, Ram & Singh, 2013).

It is well known that if infant mortality rates are high, health standards for all segments of the population are likely to be low. (Goldman & Grossman, 1988).

In the literature, the effect of public health spending on enhancing or worsening health status has gotten comparatively little attention. It has been maintained that government involvement in the healthcare industry is required for a number of reasons, including the benefits of health and the incapacity of the free market to satisfy the current demand for healthcare (Self and Grabowski, 2003).

In India, very little research work is done on the health sector, particularly on expenditure and health indicators. There hasn't been much research work done on health and empowerment. Therefore, this paper attempts to discuss the relationship between rural health and rural empowerment with following objectives-

- To find out the disparities in rural healthcare expenditure across Indian states.
- To examine the relationship between rural healthcare spending and health outcomes.
- To analyze the association between rural empowerment and health outcomes.

Data Source & Methodology

The current analysis relies on secondary data gathered from several published sources. Data on state wise expenditure on the National Rural Health Mission (NRHM) was gathered from the Ministry of Health and Family Welfare (2021). State-level data on estimated rural population, rural infant mortality rate(IMR), rural crude birth rate(CBR), and rural crude death rate(CDR) were obtained from Rural Health Statistics 2021-2022. Furthermore, data on Under 5 Mortality Rate (U5MR) was acquired from the NFHS 5.

The present study evaluates the above mentioned objectives in 22 Indian States: Arunachal Pradesh, Bihar, Uttar Pradesh, Jharkhand, Assam, Goa, Haryana, Madhya Pradesh, Karnataka, Tamilnadu, Rajasthan, Punjab, Andhra

Pradesh, Uttarakhand, Maharashtra, Kerala, Chhattisgarh, West Bengal, Jammu & Kashmir, Himachal Pradesh, Gujarat and Odisha for the time period 2021-2022. States were chosen based on the availability of reliable and consistent data for the research.

The average rural health expenditure was computed using two years of spending data, 2020-21 and 2021-2022. Per capita National Rural Health Mission expenditure (PCNRHME) was calculated by dividing NRHM expenditure by rural population. The state wise variation in rural public health expenditure was depicted using a bar diagram. A correlation matrix was constructed to show the relationship between all the five variables. Linear regression model was used to investigate the relationship between NRHM expenditure and rural health outcomes such as IMR, CDR, CBR and U5MR.

Econometric Model Building

The ordinary least squares regression model was constructed in the present study to demonstrate the impact of Per Capita National Rural Health Expenditure (PCNRHME) on IMR, CBR, CDR, and U5MR.

$$IMR_i = \alpha_0 + \alpha_1 PCNRHME_i + u_i \quad 1$$

$$CBR_i = \alpha_0 + \alpha_1 PCNRHME_i + u_i \quad 2$$

$$CDR_i = \alpha_0 + \alpha_1 PCNRHME_i + u_i \quad 3$$

$$U5MR_i = \alpha_0 + \alpha_1 PCNRHME_i + ui \quad 4$$

Here, Infant Mortality Rate, crude birth rate, crude death rate, and Under 5 mortality rate are the outcome variables for i states, respectively. These variables were determined for the years 2021-2022 across Indian states. α0 is the intercept which indicates the predicted value of the outcome variable when the explanatory variable is 0. α1 is the regression coefficient reflecting the expected changes on the dependent variable when the independent variable increases. ui is the error term. The average of National Rural Health Mission spending in the states for the years 2020–2021 and 2021–2022 was used to create the variable PCNHRME.

Results and Discussion

Nature of Rural expenditure through NRHM in Indian states -

The expenditure through NRHM is an important component of the rural health care system. It is evident from Figure 1 that there is diversity in the per capita NRHM expenditure across Indian states. The bar diagram shows that per capita public health expenditure in Goa remained relatively high during the study period. Following Goa, Arunachal Pradesh and Kerala have comparatively high per capita rural public health expenditure. The population of these

states is lower than the other states of India, which may be one of the key reasons for these states' higher per capita rural health expenditure. On the other hand, Andhra Pradesh, Chhattisgarh, and Himachal Pradesh, have a medium level of per capita rural health expenditure. During the study period, Bihar had the lowest per capita rural health expenditure among the states, followed by Jharkhand and Uttar Pradesh.

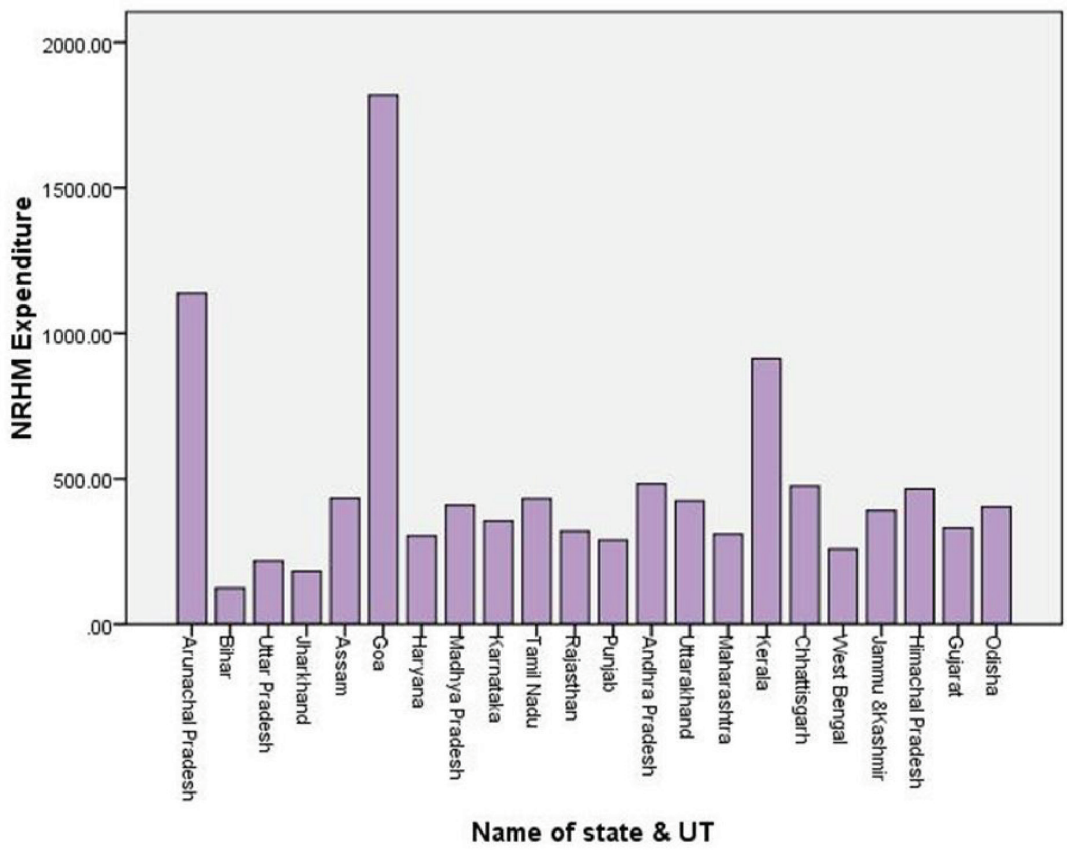

Figure 1: State-Wise Variation in Per Capita NRHM Expenditure Across Indian States
Source : Author's own estimation based on data gathered from Ministry of Health and Family Welfare (2021)

Correlation between PCNRHME, IMR, CBR, CDR and U5MR

Table 1 indicates a positive correlation between some of the variables, including CDR and IMR, CBR and IMR, U5MR and IMR, PCSC and PCNRHME, and PCSC

and CDR. The relationship between PCNRHME and PCSC demonstrates that an increase in per capita public health expenditure also increases the number of per capita sub centers in rural areas. On the other hand, there is a negative relationship between PCNRHME and CBR, PCNRHME and U5MR, PCSC and IMR, PCPHC and IMR, PCSC and U5MR and PCPHC and U5MR. The negative relationship reveals that an increase in the PCNRHME leads to a decrease in the U5MR. It also reveals that an increase in the number of PCSC and PCPHC leads to a decrease in the IMR and U5MR in rural areas.

Table 1: Correlation Matrix Between PCNRHME, IMR, CBR, CDR and U5MR

Indicator	IMR	PCNRHME	CDR	CBR	U5MR	PCPHC	PCSC
IMR	1						
PCNHRME	-0.48	1					
CDR	0.15	0.029	1				
CBR	0.84	-0.51	-0.13	1			
U5MR	0.82	-0.65	0.18	0.85	1		
PCPHC	-0.50	0.56	-0.082	-0.53	-0.66	1	
PCSC	-0.70	0.83	0.084	-0.69	-0.76	0.66	1

Source : Author's estimation based on data gathered from Ministry of Health and Family Welfare (2021), Rural Health Statistics 2021-2022 and NFHS 5. Note: IMR, number of infant deaths per 1000 live births; PCNRHME, per capita national rural health mission expenditure; CDR, the annual number of deaths per 1,000 projected population at the middle of the year; CBR, the annual number of live births per 1,000 projected population at the middle of the year; U5MR, the number of deaths under the age of five per 1,000 newborns; PCPHC, number of primary health centers per population; PCSC, number of sub centers per population

Estimating the Impact of NRHM Expenditure on Health Outcomes

Table 2 shows the expected impact of the per capita National Rural Health Mission expenditure on infant mortality rate (IMR), Crude birth rate (CBR), crude death rate (CDR) and under five mortality rate (U5MR). Shapiro- wilk test has been used to check normality. All the variables have P value more than 0.05 showing that they are normally distributed.

To identify the heteroscedasticity problem, a scatter plot graph has been used. Scatter plot graph shows that there is no clear pattern in the graph, indicating there is no heteroscedasticity problem. The regression coefficient between PCNRHME and IMR is -0.014, indicating that every unit increase in rural expenditure results in a 0.014 drop in infant mortality rate (IMR). From this it is clear that NRHM expenditure has a favorable impact on IMR reduction. The model is statistically significant owing to the F-statistic (6.11) and its p value (0.02).

The regression coefficient between NRHM expenditure and CBR is -0.006 indicates that for every unit increase in rural expenditure, there is a corresponding 0.006 decrease in CBR. The F-statistic is 7.19 and p value is 0.014 demonstrate that the model is statistically significant. Furthermore, the regression coefficient between NRHM expenditure and U5MR is -0.026 meaning that for every unit increase in NRHM expenditure, U5MR declines by 0.026. It indicates that rural health expenditure positively affects the decline in U5MR. the statistical significance is observed by the F statistics (14.82) and P value (0.001). Conversely, the CDR increases by 0.00007 for every unit increase in NRHM spending, according to the regression coefficient between NRHM expenditure and CDR of 0.00007. P value (0.89) indicates that there is no statistical significance.

Table 2 : Impact of PCNRHME Eaxpenditure on IMR, CDR, CBR and U5MR

Variables	W		P	
IMR	0.97		0.75	
CDR	0.97		0.80	
CBR	0.93		0.14	
U5MR	0.98		0.96	
Ordinary least square results				
Independent variables & others	Dependent variables			
	IMR	CDR	CBR	U5MR
PCNRHME	-0.014** (0.023)	0.00007 (0.89)	-0.006 (0.14)	-0.026*** (0.001)
Constant	32.35	6.52	21.93	48.72
R2	0.23	0.001	0.27	0.43
F	6.11	0.017	7.19	14.82
Observations (states)	22	22	22	22

*Source : Author's estimation based on data gathered from Ministry of Health and Family Welfare (2021), Rural Health Statistics 2021-2022 and NFHS 5. Note : Abbreviations: IMR, number of infant deaths per 1000 live births; CDR, the annual number of deaths per 1,000 projected population at the middle of the year; CBR, the annual number of live births per 1,000 projected population at the middle of the year; U5MR, the number of deaths under the age of five per 1,000 newborns. *p < 0.10, **p < 0.05, and ***p < 0.01.*

Descriptive Statistics

Table 3 illustrates the variable summary statistics. According to the overall findings, the average per capita national rural health mission expenditure (PCNRHME) for the 22 Indian states is ₹ 4.76 thousand. The mean IMR is 10.89. There is a significant variation between the maximum PCNRHME of 1187.67 and the minimum value of 124.41 as well as maximum IMR of 47 and minimum IMR of 4. Likewise the average of CBR, CDR and U5MR are 4.49, 0.89 and 1.49 respectively.

Table 3 : Summary Statistics of the Variables

Variable	Maximum	Minimum	Mean	SD
PCNRHME	1817.67	124.41	4.76	3.73
IMR	47	4	25.64	10.89
CBR	26.20	11.70	18.98	4.49
CDR	8.40	4.90	6.55	0.89
U5MR	62.50	6.40	36.36	1.49

Source : Author's own estimation based on data gathered from Ministry of Health and Family Welfare (2021), Rural Health Statistics 2021-2022 and NFHS 5

Relationship between Rural Health and Empowerment

There is a strong correlation between rural empowerment and health status. Improvement of rural health contributes to economic development of a region as a healthy population can be more productive. Similarly rural empowerment helps to alleviate health problems of individuals. Some of the key connection between them are-

Reduce Out-of-Pocket Expenditure

OOPE is relatively high in rural areas which is a significant cause of poverty among the rural households. A rise in per capita rural health expenditure leads to a decrease in OOPE of individuals. With a decline in OOPE, individuals can concentrate on leading a better lifestyle. The OOP expenditure in public health centers, adjusting for inflation, has declined over time, possibly due to increased spending under the NRHM (Sanjay and Akanksha, 2012).

Increasing Productivity

The cost of keeping a healthy lifestyle will go down when health infrastructure reaches a satisfactory level. This will motivate people to invest in acquiring diverse skills, and a fit and knowledgeable labour force will raise total output, boosting the rural economy. Sicker workers had a much greater risk of experiencing one or more reduced-productivity days on the job than healthier workers (Karen, Sara .Michelle, Alice, Alyssa, 2005).

Reduced Work Day Loss

A person may experience workday loss if their health deteriorates

and this can affect their productivity and income. With increased NRHM spending has led to a satisfactory level of workers' health, potentially reducing their workday loss. Improved health increases productivity through the following ways: (1) by reducing the number of off days due to illness; (2) due to more physical and mental energy; (3) by expanding the time for specialization and reducing the probability of job disturbance due to diseases and sickness(Siddique; Mohey-ud-din; Kiani)

Better Health & Women Empowerment

Health issues frequently prevent village women from participating in economic activity. Women's health is bound to boost their influence in socio-economic activity. Women who have good health are likely to be more empowered and vice-versa. Women who are more empowered are more likely to experience general health problems, and less likely to experience pregnancy related health problems(Davisa; Schensul;J. Schensul; Verma; Nastasi; Singh).

Conclusion and Policy Implications

A nation's development and economic activity can be significantly supported by its population's health. In developing nations, like India, the government plays a vital role in ensuring that the impoverished and in needy, particularly in rural regions, have access to affordable and quality health care. The goal of the current study was to examine how health outcomes relate to rural empowerment across Indian states. It also attempted to examine the impact of NRHM expenditure on health outcomes by using ordinary least square method.

The study's findings show that state wise variations exist in per capita NRHM expenditure in India. Per capita public health expenditure in Goa remained relatively high during the study period followed by, Arunachal Pradesh and Kerala. a smaller population might be the cause of these state's high per capita health expenditure. Bihar, however, has the lowest per capita health expenditure.

Regression coefficient shows that per capita NRHM expenditure has a favorable impact on IMR reduction, U5MR reduction and CBR reduction. However per capita NRHM expenditure has a negative impact on CDR reduction.

Correlation matrix shows that there is a high positive connection between a few of the variables, such as PCSC and PCNRHME, PCSC and CDR, U5MR and IMR, and CBR and IMR. However, PCNRHME and U5MR, PCSC and IMR, PCPHC and IMR, PCSC and U5MR, and PCPHC and U5MR all have a negative association with one another.

Rural India's empowerment may be linked to all of these health indicators, including IMR, CDR, CBR, and U5MR, which are connected to per capita NRHM expenditure. Improved health can result in lower out-of-pocket expenditure, higher productivity, fewer missed workdays, and more importantly, it empowers women, all of which are vital for the development of the country.

However, the study's findings show that there are differences in per capita NRHM spending and, consequently, health outcomes among Indian states. These differences may lead to variations in rural empowerment among Indian states. Therefore the study urges India must strengthen its healthcare sector and remove state disparities in health-care spending. The study can assist decision-makers in determining which states have lower per capita NRHM expenditures.

References

Barenberg, Andrew J., Deepankar Basu, and Ceren Soylu. "The effect of public health expenditure on infant mortality: evidence from a panel of Indian states, 1983–1984 to 2011–2012." *The Journal of Development Studies* 53.10 (2017): 1765-1784.

Kumar, Kaushalendra, Faujdar Ram, and Abhishek Singh. "Public health spending on infant and child mortality in India during the years 1980–2006." *The Lancet* 381 (2013): S76.

Gollub, Erica L. "The female condom: tool for women's empowerment." *American Journal of Public Health* 90.9 (2000): 1377.

Alsop, Ruth, and Nina Heinsohn. "Measuring empowerment in practice: Structuring analysis and framing indicators." *Available at SSRN 665062* (2005).

Grown, Caren, Geeta Rao Gupta, and Rohini Pande. "Taking action to improve women's health through gender equality and women's empowerment." *The lancet* 365.9458 (2005): 541-543.

Tinker, Irene. "Persistent inequalities." *Women and world development* (1990).

Goldman, Fred, and Michael Grossman. "The impact of public health policy: the case of community health centers." *Eastern Economic Journal* 14.1 (1988): 63-72.

Self, Sharmistha, and Richard Grabowski. "How effective is public health expenditure in improving overall health? A cross–country analysis." *Applied Economics* 35.7 (2003): 835-845.

Davis, Karen, et al. "Health and productivity among US workers." *Issue Brief (Commonw Fund)* 856.856 (2005): 1-10.

Bloom, Shelah S., David Wypij, and Monica Das Gupta. "Dimensions of women's autonomy and the influence on maternal health care utilization in a north Indian city." *Demography* 38 (2001): 67-78.

Moonzwe Davis, Lwendo, et al. "Women's empowerment and its differential impact on health in low-income communities in Mumbai, India." *Global public health* 9.5 (2014): 481-494.

Siddique, Hafiz Muhammad Abubakar, Ghulam Mohey-ud-din, and Adiqa Kiani. "Human health and worker productivity: evidence from middle-income countries." *International Journal of Innovation, Creativity and Change* 14.11 (2020): 523-544.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

A Study on the Variation of the Distribution of Urban Open Spaces Across Guwahati City

Shilpa Borah[1*] and Sourav Saha[1]

Accepted : 15 June, 2026

Abstract

Open spaces in urban areas, including parks, playgrounds, and public squares, play a crucial role in enhancing the quality of life for urban dwellers and supporting disaster preparedness. However, the availability and distribution of urban open spaces are becoming a major concern in rapidly urbanizing cities like Guwahati. This study focuses on analyzing the ward-wise availability and distribution pattern of urban open spaces in Guwahati City. Based on secondary data sources, the study identifies eight broad categories of open spaces. Among these, Type B, comprising parks, stadiums, playgrounds, Sangha, and Manch, covers the largest area (39% of total open space), followed by Type A, consisting of educational institutions and government offices (34% of total open space). The results reveal disparities in the distribution of open spaces across the 31 wards of the city. While some wards

*Correspondence :
Email : shilpaborah1991@gmail.com

[1]Department of Geography
Mahapurusha Srimanta Sankaradeva Viswavidyalaya, Nagaon, Assam-782001

Published offline : 7 August

have abundant open spaces, others lack such areas entirely. For instance, Ward No. 1 boasts the highest area of open space (115095.99 Metre2), whereas Ward No. 7 has no open space available. These findings highlight the need for effective urban planning strategies to ensure equitable access to open spaces for all residents.

Keywords Urbanization; Urban open space; Sustainability; Disasters; Guwahati city; Urban lifestyle

Introduction

Urbanization refers to the increase in the proportion of people living in Urban areas, such as towns and cities in comparison to rural areas. Urbanization may occur due to various factors like natural increase in population, rural-to-urban migration(s) caused by pull factors such as Employment opportunities, educational institutions and urban lifestyle, as well as push factors such as poor living conditions, lack of educational and economic opportunities and poor health care facilities. Urbanization started in historical times, and it still continues to transform rural or semi-urban areas into fully functional and developed towns, equipped with all basic and modern amenities. It is closely associated with modernization, industrialization and the social process of rationalization. In the recent past, rapid urbanization took place, particularly in less developed countries where rural-to-urban migration takes place at a higher rate. Along with the rapid growth of urbanization, the urban structure has also changed. The United Nations World Urbanization Prospects shows that about 4.1 billion (2017) people were living in urban areas. Among the continents, North America and South America are registered as the most urbanized with 79% of their total population living in urban areas. However, Asia shows low performance in this respect, which stands at 39% of the urban population share. In most developing countries the abrupt growth of urban land has become problematic (Tewolde & Cabral, 2011 as cited by Teimouri et al., 2023). It has led to unsustainable use of land causing land degradation, alteration on the one hand and unpredictability in local climates, which has resulted in extreme natural events including flood and drought (Emadodin et al., 2016). Urbanization causes irreversible changes from agriculture to urban areas (Luck & Wu, 2002) putting enormous pressure on limited land resources. India's urbanization is much slower than many developing countries. With the growing rural-urban migration, urbanization in India increased rapidly after independence. The largest percentage of urban growth (46%) has been recorded in India during 1971-1981. After that gradual decrease in urban growth observed, India now stands at 31.16% of urban growth (census 2011). As the

urban population increases, the number of towns are also increasing. There was a sharp rise in towns from 5161 during the census 2001 to 7935 in the census 2011. It is estimated that by the year 2050, 53% of the total population of India will be living in urban areas (Publications, 2019).

Open spaces are mainly vacant land which is not used for residential, commercial or industrial purposes. The concept of "open space" in urban areas is not only limited to urban parks and preserves, but public spaces such as streets, schoolyards, outdoor sports complexes, cemeteries and public squares are also all-important open spaces (Hall and Ward, 1998). Urban open space (UOS) mainly unbuilt, often publicly accessible, area within a populated settlement, comprising vegetated 'green', water-dominated 'blue', derelict 'brown' and hard-surfaced 'grey' elements (Jansson & Randrup, 2020). Open space consists of underdeveloped lands with significant natural, cultural and visual resources that are integral to the country's quality of life (Nelson and Whitney, 2008 as cited by Bhidae, 2017). Availability of open space, distribution and accessibility is a major concern for cities. Public open spaces in the form of parks, gardens, forests, playgrounds, stadiums etc. play a vital role in relieving stress, meditation, yoga, and leisure. Open spaces not only significantly contribute to the quality of everyday urban life but also have the capacity to facilitate recovery during a disaster. Open spaces play a vital role in planning any rescue operations and act as a short-term shelter area during any emergency or disaster. It also helps in preserving the quality of air.

UN-Habitat recommends an average of 45 - 50% of urban land be allocated to streets and open public spaces, which includes 30 - 35% for streets and sidewalks and 15 - 20% for open public spaces (UN-Habitat, 2018). In India, The Urban Regional Development Plans Formulation and Implementation (URDPFI) guidelines, 2014 recommend 10 to 12 sq. mt. of open space per person. (The Ministry of Housing and Urban Affairs, 2022)

Objectives of the Study

The objective of the study is to analyse the ward-wise availability and distribution pattern of urban open spaces in Guwahati City.

Data and Methods

The study is carried out based on secondary data sources. For obtaining the data on ward-wise availability of open spaces in Guwahati, Atlas on Open Spaces of Guwahati City 2016, prepared by Assam State Disaster Management Authority (Assam State Disaster Management Authority, 2016) has been referred. Additional extrapolation has also been carried out on the available data to calculate various parameters. ASDMA has used GIS and remote Sensing technology for the said report and used Google Earth imagery for

mapping wards in the city for the year 2015/2016. However, Open Spaces in each ward were digitised and verified on the ground using handheld GPS devices.

Study Area

Guwahati, the 'gateway of the North-East' and the only urban agglomeration of North-East India is one of the fastest-growing cities in India, lies between the banks of the mighty river Brahmaputra and the foothills of the Shillong plateau which is stretching from 26° 2′ N to 26° 16′ N latitude and 91° 33′ E to 91° 52′ E longitude is taken into consideration as the study area. It covers a geographical area of 216 km2 comprising a population of 957,352 and is categorized as a class II city of India as per the census 2011 data. The city is further divided into 31 municipal wards within the GMC (Guwahati Municipal Corporation) boundary. Although, the Guwahati Municipal Corporation (GMC) increased the total no of wards from 31 to 60 through its notification dated 31st January 2022, however, for the purpose of this study, the existing division of 31 wards is considered for maintaining uniformity.

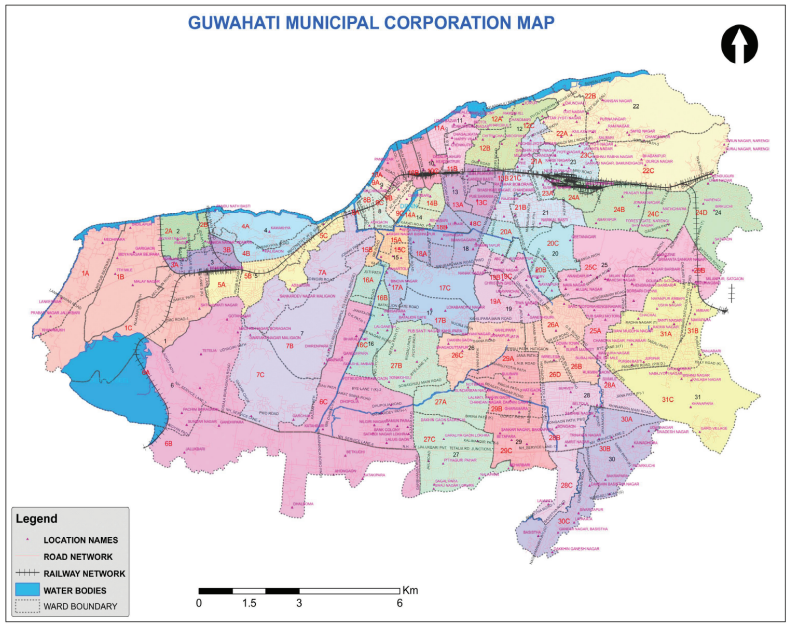

Figure 1: Guwahati Municipal Corporation Map (*Master Map of GMC Ward Wise,* 2020)
Source : Authors' illustration

Favourable transport connectivity and a growing population and infrastructure have made Guwahati among India's most rapidly developing cities. After shifting capital from Shillong to Guwahati (Dispur) in 1972, the city has been experiencing a continuous inflow of people from areas within and

outside the state. The city is experiencing a steady growth in population which is also changing the dynamics of the urban open spaces of the city.

Due to the unplanned and haphazard growth of the city caused by the continuous influx of people, the availability and distribution of urban open spaces have been adversely impacted over the years causing concerns for disaster preparedness, air quality and quality of life in the city. Therefore, it is the need of the hour to study the availability and distribution of open spaces across the city.

Results and Discussion

A total of 182 numbers of open spaces have been identified across Guwahati City belonging to different types. To carry out the study in a meaningful manner, based on their nature and similarities among them, open spaces have been grouped into eight different broad categories as given in Table 1 below. This will help in the proper analysis of the data.

Table1 : Categorization of Open Spaces

Sl. No	Category	Type of Open Spaces Included in the Category
1	Type A	Educational institutions and govt. offices
2	Type B	Parks, stadiums, playgrounds, Sangha, Manch
3	Type C	Temple, Namghar, Eidgah, Gurudwara
4	Type D	Hospitals, hotels and other business establishments
5	Type E	Open space with Restricted access
6	Type F	Open space with Residential Areas
7	Type G	Parking lot
8	Type H	Miscellaneous open spaces not classified in any other category mentioned above

Source : Authors' own compilation

Table 2 : Ward-Wise Distribution of Open Spaces Across Guwahati City

Sl. No.	Ward No.	Area (Km^2)	Category-wise open space ($Metre^2$)								Ward Wise Total Open Space	
			Type A	Type B	Type C	Type D	Type E	Type F	Type G	Type H	($Metre^2$)	(Km^2)
1	1	14.98	44460.74	54880.41	6002.14	0	9752.7	0	0	0	115095.99	0.11509599
2	2	1.69	0	12116.90	1904.54	0	0	0	0	0	14021.44	0.01402144
3	3	1.41	0	6035.14	4313.61	0	0	0	0	521.83	10870.58	0.01087058
4	4	3.64	818.39	0	7377.45	0	0	0	0	2549.09	10744.93	0.01074493
5	5	3.38	19491.11	24932.61	5827.47	4065.89	0	0	0	0	54317.08	0.05431708
6	6	25.97	73652.99	3461.81	3668.39	0	0	2795.71	0	16594.62	100173.2	0.1001732
7	7	13.03	0	0	0	0	0	0	0	0	0	0
8	8	1.14	0	15109.73	0	0	0	0	0	0	15109.73	0.01510973
9	9	0.91	0	0	2942.57	3278.82	39039.86	0	0	33431.56	78692.81	0.07869281
10	10	2.19	4509.08	45366.8	0	2515.49	0	0	6649.79	0	59041.16	0.05904116
11	11	2.06	445.49	5262.36	0	0	0	0	0	0	5707.85	0.00570785
12	12	3.08	0	7706.37	2351.14	0	0	0	0	0	10057.51	0.01005751
13	13	2.05	742.20	28203.85	2890.92	0	0	0	1451.83	0	33288.8	0.0332888
14	14	1.22	0	0	0	0	3031.5	0	0	0	3031.5	0.0030315
15	15	1.28	7013.72	2791.38	0	0	0	0	0	2127.02	11932.12	0.01193212
16	16	2.50	0	32205.39	2843	0	0	0	0	0	35048.39	0.03504839
17	17	4.49	6002.55	0	0	0	11264.69	0	0	0	17267.24	0.01726724
18	18	2.93	2911.87	2190.61	2824.57	0	0	0	0	0	7927.05	0.00792705
19	19	3.53	9131.11	0	0	4617.70	0	0	9779.98	0	23528.79	0.02352879
20	20	3.46	0	4442.72	0	0	0	0	0	0	4442.72	0.00444272
21	21	3.36	17352.63	20250.06	1859.05	0	0	19089.48	0	0	58551.22	0.05855122
22	22	13.25	4386.19	35668.85	1737.36	0	0	0	0	0	41792.4	0.0417924
23	23	2.15	1767.05	9595.16	0	0	0	5089.45	0	0	16451.66	0.01645166
24	24	8.15	0	22984.33	0	0	9344.57	0	0	0	32328.9	0.0323289
25	25	8.89	8512.18	0	0	0	0	0	0	0	8512.18	0.00851218
26	26	6.72	25255.57	8239.49	12543.59	0	0	0	0	0	46038.65	0.04603865
27	27	9.89	10090.74	97918.86	0	0	0	0	0	0	108009.6	0.1080096
28	28	5.30	18794.81	0	807.81	0	28720.29	2060	0	0	50382.91	0.05038291
29	29	5.42	935.44	0	4226.74	0	0	0	0	0	5162.18	0.00516218
30	30	6.28	111305	1098.49	0	0	0	0	0	0	112403.49	0.11240349
31	31	11.70	21572.79	2310.05	3252.51	14891.44	0	0	0	0	42026.79	0.04202679
Category Wise Total Open Space			**389151.7**	**442771.4**	**67372.86**	**29369.34**	**101153.6**	**29034.64**	**17881.6**	**55224.12**	1131959.0	1.13195887

Source : Authors' own calculation

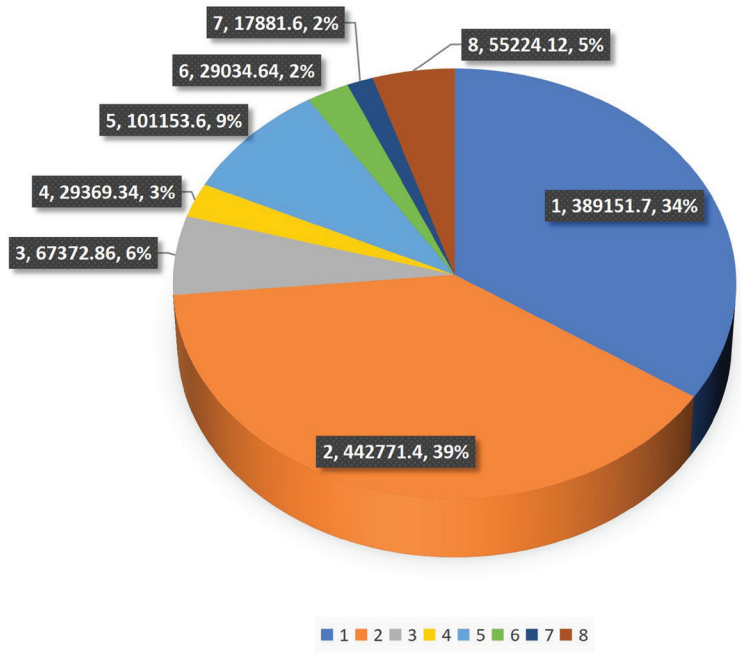

Figure 2 : Category-Wise Area Shares of Open Spaces in Percentage and Metre². *Source : Authors' illustration*

Table 2 and Figure 2 show the ward-wise distribution of open spaces. Among the eight categories of open spaces, the Type B category covers the highest area measuring 442771.4 Metre2 which is 39% of the total open space consisting of parks, stadiums, playgrounds, sangha and manch. It is followed by Type A comprising of educational institutions and government offices covering 389151.7 Metre2 area which is 34% of total open space. Type E i.e., open spaces with restricted areas constitute 9% of the total open spaces which amounts to an area of 101153.6 Metre2. Consisting of different religious establishments, Type C covers an area of 67372.86 Metre2 which accounts for 6% of the total open area. The area occupied by Type H stands at 55224.12 Metre2 which is 5% of the total open space. Type D consists of hospitals, hotels and other establishments and Type F consists of open spaces with residential areas covering almost equal areas of 29369.34 Metre2 and 29034.64 Metre2 respectively. Designated Parking lots, which are categorized under Type G and only found in three wards, cover the lowest area among all categories i.e., 17881 Metre².

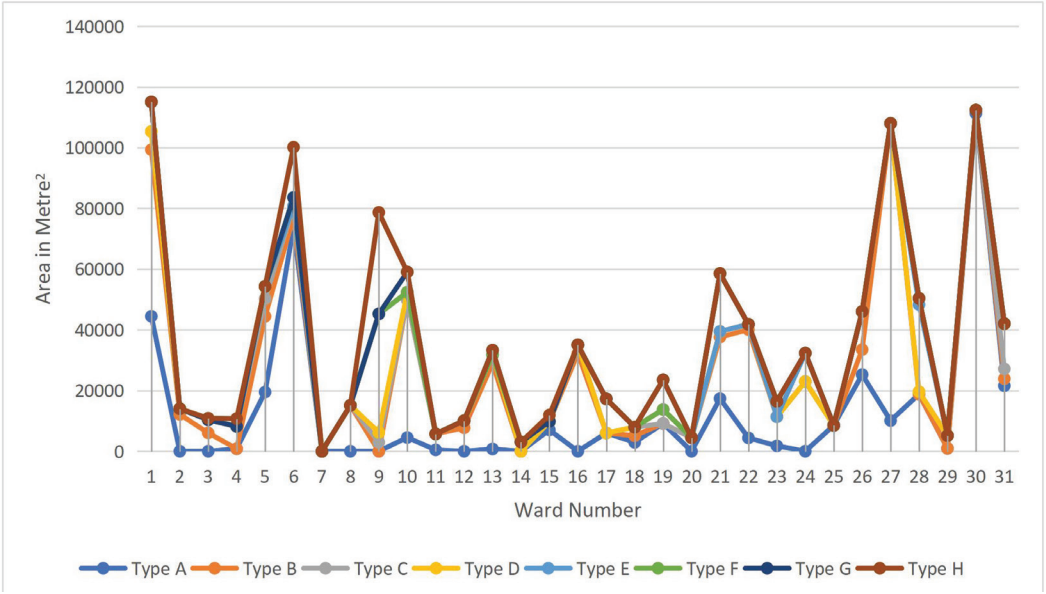

Figure 3: Ward-Wise Distribution of Open Spaces. *Source : Authors' illustration*

Apart from the type-wise variation of urban open spaces, the variation of distribution in terms of total open space and categories of open spaces available in each ward were also observed while studying the ward-wise availability and distribution of urban open spaces in Guwahati city. Type B category of open spaces consisting of parks, stadiums, playgrounds, sangha and manch plays a vital role in improving the quality of life of the citizens by facilitating activities like meditation, yoga, sports and leisure etc. But when the picture of ward-wise availability of Type B open space was analyzed, it is found that only 22 wards out of a total of 31 wards were having open space of this category available among them. Again, the type G category of open space which consists of designated parking lots, has been found in only 3 wards in the city. Coming to the ward-wise availability of open spaces, it is found that among the 31 wards, ward no.1 has the highest area of open space available i.e., 115095.99 Metre2 and on the other hand ward no. 7 has no open space at all.

Conclusion

This study sheds light on the availability and distribution of urban open spaces across Guwahati City, one of the fastest-growing cities in India. The findings emphasize the importance of addressing the challenges posed by

urbanization to ensure equitable access to open spaces for all residents. The analysis revealed disparities in the distribution of open spaces across different wards in the city. While some wards boast ample open spaces, others face a complete lack of such areas. This imbalance can have significant implications for disaster preparedness, air quality, and the overall quality of life for urban dwellers. To address these challenges and facilitate sustainable urban development of the city, proactive urban planning strategies are necessary. The government should consider the spatial distribution of open spaces and prioritize the development and preservation of public parks, playgrounds, and recreational areas. Collaborative efforts between urban planners, policymakers, and citizen communities are essential to ensure that open spaces are distributed in a manner that benefits all residents.

References

Assam State Disaster Management Authority (2016): *Atlas on Open Spaces of Guwahati City,* Guwahati: ASDMA.

Emadodin, I., Taravat, A., and Rajaei, M. (2016): "Effects of urban sprawl on local climate: A case study, north-central Iran," *Urban Climate,* Vol 17, pp 230–247.

Hall, P. G., and Ward, C. (1998): Sociable Cities: *The Legacy of Ebenezer Howard,* London: Academy Press.

Jansson, M., and Randrup, T. B. (Eds.) (2020): *Urban Open Space Governance and Management,* London: Routledge.

Luck, M., and Wu, J. (2002): "A gradient analysis of urban landscape pattern: A case study from the Phoenix metropolitan region, Arizona, USA," *Landscape Ecology,* Vol 17, pp 327–339.

Master Map of GMC Ward Wise (2020): *Wikimedia Commons,* Retrieved September 30, 2020, from https://commons.wikimedia.org/wiki/File:GMC-MAP-1.png

United Nations, Department of Economic and Social Affairs, Population Division (2019): World Urbanization Prospects 2018: Highlights (ST/ESA/SER.A/421), New York: United Nations.

The Ministry of Housing and Urban Affairs (2022): "Press Release on Urban Planning and Open Space Guidelines," Press Information Bureau, Government of India. Retrieved July 12, 2023, from https://pib.gov.in/PressReleasePage.aspx?PRID=1813182

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Role of Indigenous Knowledge Systems in Eco-Sustainable Practice of Agriculture and Animal Husbandry among the Monpa Tribes of Arunachal Pradesh

Dinky Mishra[1*]

Accepted : 20 June, 2026

Abstract

Food security and the general improvement of the sustainability of natural resources are facilitated by the indigenous knowledge (IK), which is adapted to the local culture, social organisation, need-based, tried and tested over centuries and dynamic in nature. The research was conducted during 2024-2025, purposively on local tribe community, randomly 15 selected villages of Three Blocks Viz; Tawang, Jang and Lumla in Tawang district of Arunachal Pradesh. 08 respondents were randomly selected from each village (total 120) list provided by the Village Extension Workers, Participatory rural appraisal (PRA) and personal interview

*Correspondence :
Email: dinkymishra@gmail.com

[1]Department of Geography
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

methods were applied to collect the data on Knowledge of agriculture and livestock rearing and management. Result revealed that traditions maintained by various cultural and social institutions of Monpa community are having strong ethical base while harvesting the plants and animals, and deciding the consumption pattern of foods. There is urgent need for awareness programmes on importance of local livelihood support crops and to involve them in food biodiversity based natural resource conservation for sustainable management of local livestock and agricultural crops, bio-resources for rural livelihood security.

Keywords Indigenous technical knowledge; Agriculture; Livestock; Farmers

Introduction

The indigenous knowledge (IK) is not only economically viable but also locally feasible. Indigenous knowledge is diminishing at an alarming rate with ageing of those in the indigenous population with strong links to the past *(Maundu 1995)*. Each person of the community has a different amount and quality of IK based on their gender, age, social standing, career, level of connection to the local natural resources, and intellectual capacity. *(Berkes et al. 2000, Sarah, L 2002; Turner & Earths 2005).* Rural lives that are dynamic and complex typically believe in the diversity of plants, animals, and ecosystems, both in their natural state and in various levels of domestication. Diverse forms of biodiversity and natural resources that are preserved and utilized by various individuals at various times and locations make complex contributions to sustainable livelihood strategies. Agro-biodiversity saved and stewarded by local people is not just about conservation — it's a dynamic, functional asset that supports productivity, resilience, and sustainability in all farming systems. It's a bridge between tradition and innovation. *(Pimbert, 1999 and UNEP-CBD, 1999)*. Arunachal Pradesh, nestled in the eastern Himalayan region, is considered a biodiversity hotspot due to its varied climatic zones and ecological niches. This region is home to a vast number of plant, animal, and microbial species, many of which are endemic or rare. The biodiversity here is closely intertwined with the lives and livelihoods of the indigenous tribal communities. *(Rakesh, E.S. 2014)*. The tribal population in Arunachal Pradesh comprises numerous ethnic groups, each with distinct languages, traditions, and knowledge systems. Major tribes include the

Apatani, Nyishi, Adi, Galo, Monpa, and Mishmi, among others. The Monpa tribe of Arunachal Pradesh, with agriculture and animal husbandry as the backbone of their economy and social structure, possesses a rich Traditional Knowledge System (TKS) that has historically guided their relationship with natural resources and enabled biodiversity conservation. This knowledge is deeply intertwined with their cultural, spiritual, and social institutions. *Singh and Sureja 2006.*

Methodology

The Monpa tribe of Arunachal Pradesh lives in Tawang District at higher elevations between 3,500 and 22,500 feet above mean sea level. Three blocks, Tawang, Jang, and Lumla, were used in the current study, which was carried out in the district of Tawang, Arunachal Pradesh, in 2024–2025. A total of fifteen villages were purposefully chosen at random: Tawang block; Changbu, Kitpi, Kinmey, Seru, and Surbi under Jang block; Lhou, Jang, Kharsa, Namazing, and Jangda under Lumla block; Gispu, Kharteng, Lumla, Kungba, and Namtsering. Each village had eight randomly chosen respondents from a list of 120 people who were surveyed by the Village Extension Workers and interviewed in-person using a questionnaire. The Gaon Burha (Gram Pradhan) gave their informed consent to share and publish their knowledge system in order to formally acknowledge them as knowledgeable about agriculture, livestock rearing, and other management practices used by the local tribes. Secondary information was acquired from central and district offices, professional researchers and officials to crosscheck the source data *(Sedhain, 1993).* Moreover, the literatures, reports and papers linked to this study are evaluated as the references to testify the information we received and collected.

Indigenous Knowledge Regarding Agriculture

Tawang's economy is mostly dependent on agriculture, which is the primary occupation of its residents. Top hill, middle hill, and foothill agriculture are the three main classifications used to describe the local agricultural area. Although shifting cultivation is used in some areas, permanent cultivation occupies the majority of their agricultural land. Fenthina (dwarf variety, duration 3 months), Thinasheru (tall variety, duration 5 months), and Baklangboo (medium tall variety, sown for the festival of Lohsar [January to February], duration 4 months) are indigenous maizes due to the Monpas' adaptation of terrace cultivation, both wet and dry. The

district's total gross crop area is 5314 ha. Maize is most commonly used to make Chang beer, a native beverage that is said to treat a variety of illnesses in both humans and animals. While finger millet is planted in the central hills and wheat and barley are produced in the upper parts of the hills, paddy crops are grown in the foothills. Therefore, the community, not an individual, decides how to use the local resources that are accessible. Tribal people have cultivated skills throughout ages that are appropriate for the unique ecology and habitat in which they live and conduct their agricultural operations. The women have a range of diversified gene banks of indigenous varieties of wheat, barley (Bong, with or without awns), Phaphda teeta (buckwheat), Phaphda meetha (buckwheat), paddy (Sungsungbara), finger millet (mandua), Indian bean (Lab-lab purpureus), rajmabean (Phaseolus vulgaris), millet (Bundagmo, Panicum psilopodium var. psilopodium), coriander (Ush), bottle gourd (Lau), cucumber (Manthong), soybean (Lee), pumpkin (Broomsa peela, Broomsa saphed, Cucurbita moschata), bitter gourd (Kaibandu), spinach (Taktak), field pea, mustard species (Lai Saag, varieties Leme and Penche, Brassica spp), garlic (Lamm), Mann bada (Allium spp.), Mann Chhota (Allium spp.), onion (Chong), millet (Moo, Panicum psilopodium var. coloradum) and chilli (Solu) and varieties of maize (Fenthina, Thinasheru and Baklangboo). Many spices, like star anise (small and big varieties), timbur (prickly ash, Zanthoxylum armatum) and corn pepper are commercially available from local markets and are sold by women these are rich source of income *(Singh et al. 2007).* The Monpa tribe had perfected the process of making a variety of foods and drinks. These foods, which are made with the aid of crops like rice, wheat, maize, barley, finger millet, buckwheat, vegetables, yak meat, and milk, include Thukpa, Momos, Khura, Zan, Puta, Khazi, Bresi, Khapse, Chhurpi, and so on. Shing-chang, Baang-chang, Aarak, Marchang, Monpa tea, and other regional drinks were made by fermenting, distilling, and brewing food grains (Pandey et al. 2017). It is implied that the people must preserve more than eight variations (of three species) of indigenous pine in order to carry out Buddhist rites, worship, and customs. Lamas, or priests, post a notice to gather cuttings and seedlings from woods on a specific day and time in order to domesticate local tree species. Even during various agricultural operations, Buddhism plays a crucial role. For example, specific religious authorization must be obtained from the village Lama

before to harvesting the local maize. People think that if this isn't done, there would be a lot of diseases in the next harvest.

Indigenous Knowledge Regarding Horticulture Crops

The progressive cultivators of this district reap a good harvest of cash crops like apple, kiwi, walnut, orange, plum, peach, cabbage, tomato, turnip, potato, and other leafy vegetables, among others. Tawang is known for its terraced cultivation and production of the Kufri Jyoti variety of potatoes, which is very popular. In recent years, many horticultural crops have also been taken up in a big way. Kitchen gardens are essential to the Monpa tribes' food and nutritional security since they provide them with fruit trees, vegetables, medicines, spices, and condiments for everyday use. In the kitchen gardens, where there are perennial fruit trees, annual crops such as maize, beans, chillies, and amaranths are produced as mixed crops and intercrops. The cowpea and bean vines are supported by these fruit trees. Kitchen gardens make it simple for people to obtain a range of resources, including food, fire wood, fodder, and medications, especially during the wet seasons. In Tawang, the impoverished people's kitchen gardens, which produced plum, apple, and peach trees, were mentioned as important sources of revenue. Growing in household gardens, radish and lai patta (Brassica spp.) contribute to the stock that communities rely on for revenue and overall livelihood security. Grafting fruit trees is a technique that some farmers possess; they may even graft various kinds onto a single tree. For example, there are pairings of peaches and apples as well as apples and pears. As the fallow time has been reduced to 7-8 years, issues with deforestation, soil erosion, and declining fertility have recently getting worse. Pressure from the land's constantly growing population and the increasing demands for region's fruit crops—apple, peach, plum, kiwi fruit, etc.—is the responsible factor. The amount of time available for natural processes to replenish soil fertility is insufficient. Shifting cultivation is mostly to blame for silt deposition in nearby rivers and the on-going retreat of valuable forest species because the entire ecosystem's site is frequently altered. Non-woody forest species like vegetables, mushrooms, medicinal plants, roots, and tubers are frequently used for both direct consumption and revenue generating. The Monpa tribe relies heavily on mushrooms as their primary protein source while meat is

another protein source. The monpa tribe relies on nature for their daily needs and survival (Table 1).

Indigenous Knowledge Regarding Animal Husbandry Practices

The district's climate is mild and pleasant in the summer and bitterly cold and frigid in the winter, making it extremely difficult for farmers to raise animals. cattle, crossbreds, hilly breeds, mithun, goats, sheep, yaks, pigs, poultry, horses, ponies, and other species are the most common livestock species in the district. Mithun are primarily raised for their flesh, which is thought to be superior to that of other species and more delicate. Mithun milk is of excellent quality and may be utilized to make a variety of milk products, despite being produced in smaller quantities. Additionally, according to *Mondal et al. (2014)*, this animal is utilized as a sacrificial animal for many social and cultural rites as well as a marriage gift. Higher elevations are crucial for yaks. Among the Monpa Community, sheep husbandry is also very common. Aquaculture is another way that some groups cultivate fish in rivers and their tributaries. A small slope should be included on the site chosen for community grazing in order to prevent soil erosion and maintain native vegetation. Local farmers use sheep dung and pee to improve the soil and fertilize it. As a result, the quantity of sheep on the soil has an impact on its fertility. In order to manage resources, the Brokpa typically utilizes a portion of his income to fertilize the land. Temporary fencing made of bamboo or wood is set up for a designated area, and sheep herding, or Terske, is organized at night. A hut called Brokbrang, locally constructed of stones and wood, is used as the residence during grazing. Preference is given for sheep herding in the top parts of the hills, because here barley, wheat and some temperate vegetables like Mann (Allium sp.), Laipatta (Brassica spp.), local potato, onion, etc. are grown, where carrying and transportation of organic manure is difficult. Only indigenous sheep breeds are utilized to make dum (wool), which is used to weave various fabrics like shirts, caps, and pants rather than sweaters. Additionally, it is the greatest source of revenue for Monpa women's empowerment. For the grazing of sheep, goats, cows, horses, and yaks, the grazing fields are chosen close to the local water resources (Nala, small and big rivers, as well as ponds and fountains). The soil is light black in color with a high percentage of clay and is covered in flora (Turner et al., 2005). According to custom, the Brokpas, who are nomadic pastoral tribes lives in the high-altitude

areas of Arunachal Pradesh's Tawang and West Kameng districts, are in charge of delivering yak meat and milk products to various communities following the summer grazing season. The women are in charge of taking care of the house and preparing ethnic meals for the men. Members of the Monpa tribe are prohibited by Buddhism from plugging bamboo shoots before they are ready for food. The hard climate and need for food security has forced them to use bamboo leaves as the fodder for their yak and Dzomo. During winter season, the grasses are covered with ice and local yaks are allowed to scratch the ice and graze. Yak grazes in open areas for grazing. Grazing yaks are called by herders by whistling or singing *(Thresher P, 1992)*. During night yaks are delivered to the shed for cover from wild animals and for milking. In summer season yaks are left free for grazing early and brought late to the shed but during the winter season yaks leave late and brought back early. Feed intake of Yak is a smaller amount than other cattle, probably due to their smaller rumen capacity. The yak and Dzomo breeds are reared during the calving period under the prevailing local grazing and forest conditions *(Singh and Brokpa Community 2009)*. After calving, the yak is fed with a mix of common salt and flour of ragi, barley and maize. It helps in recovering the pain after calf delivery and increases the milk yield. The yak feeds on palatable shrubs like Kobresia napalensis ("sun buki"), Kobresia capillifolia ("kesari buki"), Carex nivalis ("dharkhare"), Phleum alpinum ("doodhe jharr"), Festuca valesiaca ("rani buki"), Kobresia duthiei ("bhalu buki"), Juncus sp. ("suire buki"), Allium prattii ("dandu"), Heracleum sp. ("ganer"), Selinum tenuifolium ("cheeru"), Rheum acuminatum ("khokim") and Carex nigra ("harkat"), during the summer season. For the grazing of yak, sheep, goats and other animals, a specific date is set by the people of a hamlet to avoid conflict and instead attempt to sustain the available forage and grass *(Pandey, et al., 2017)*. Brokpa use pasture of people by paying different sort of grazing fees. Beyond which if someone is accessing the pasture more, then he's fined by the Goan Burha. The grazing grounds are mostly belonged to the community, clan, individual and monastery. Monpa Tribes are curing different diseases and disorders by using ethno veterinary medicines by their informal experimentation, location specific observations and locally available medicinal plants.

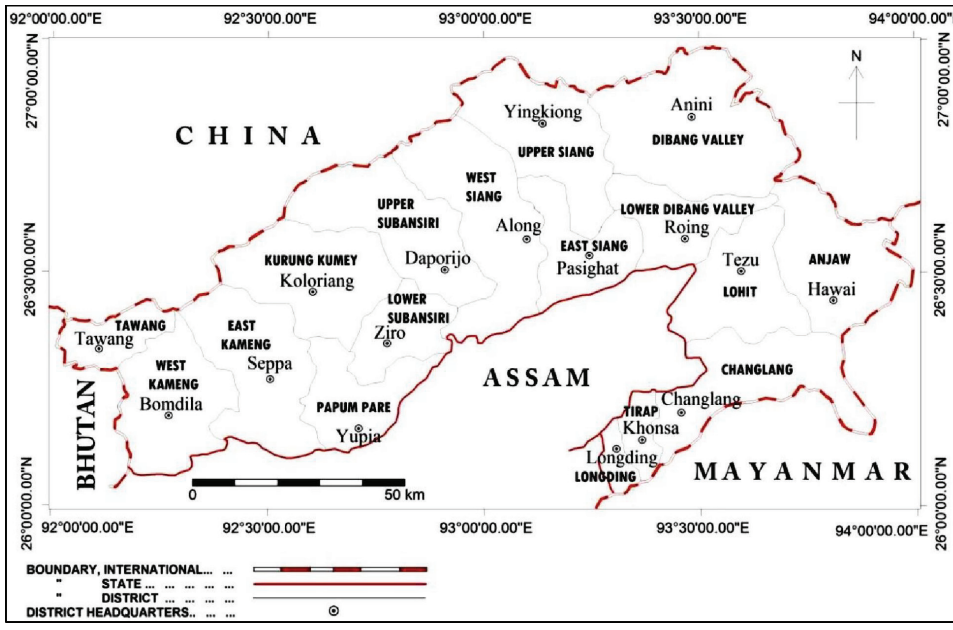

Figure 1: Map Showing the Study Sites in Tawang District, Arunachal Pradesh. *Source : Authors' illustration*

Table 1: Use of traditional Crops, Part Used in Foods

Species	Local Name	Botanical Name	Part Use in food	Season of Availability	Conservation mode
Barley	Nai	Hordeum vulgare	Grain	May - June	Shifting land and home garden
Finger millets	Comp	Eleusine coracana	Grain	November	Shifting land
Wheat	Ko, Nass	Triticum astivam	Grain	May - June	Shifting land and home garden
Buck wheat	Brame	Fagopyrum esculentum Moench	Immature grain use for Tem(Vegetable), Mature / grain use for Phe (Atta)	April- May	Shifting land, home garden and community forest

Rice	Debh, Nu	Oryza sativa	Grain	October - November	Shifting land
Maize	Ashom	Zea Mays	Immature and mature grain	July to October	Shifting land and home garden
Cabbage	Rupong, Pongru	Brassica oleracea var.capitata	Leaf	Round year	Shifting land and home garden
Local Spanich	Patse	Spinaciao leracia	Leaf	April to October	Domesticated in home garden
Radish	Ker	Raphanus sativa	root	Round year	Domesticated in home garden
Bitter gourd	Khau Bando, Ru, Kho Kairy	Momordica charantia	Fruit	July to October	Shifting land and home garden
Pumpkin	Brumsa	Cucurbita moschata	Fruit, Tender leaf	July to September	Shifting land and home garden
Onion	Tshong	Allium cepa	Leaf, Bulb	January	Shifting land and home garden
Garlic	chhet	Allium sativam	Leaf, Bulb	August	Shifting land and home garden
Lettuce	Notch Ru	Lactuca sativa	Leaf	April to October	Shifting land and home garden
Layi Patta	Petsa Ru	Brasicca spp.	Leaf	Whole year	Domesticated in home garden
Local chillies	Solu	Capsicum frutescence	fruit	July to September	Domesticated in home garden

Man patta	Man	Allium spp.	Leaf	April to July	Shifting land, home garden and / community forest
Local Mushroom	Moo	Agaricus Spp.	Whole plant	April to July	Community forest
Soya bean	Kya grap	Glycine max Merrill	Grain	October	Shifting land

Source : Authors' compilation

Crop variety and Soil Health: The Monpa Tribe have retained a high level of wild genetic heterogeneities of crop through an extensive succession of farming practices over time, rendering the germplasm sensitive to shifting environmental factors *(Dasmann, 1991)*. Table 1 shows the variety of crops and their consumption habit among Monpas.

Table 2: Main Cover Crops Used by the Monpas and their Respective Efficiency for Different Functions

Main Function	Human consumption	Livestock Consumption	Availability during dry periods	Decomposition rate	N fixation
Pigeon Pea (Cajanus cajan)	+++	+++	+++	+++	+++
Indian Goosegrass (Elusine indica)	-	+++	++	++	++
Rattlepods / (Crotalaria sp.)	-	++	-	++	++
Jowar / (Sorghum)	-	+++	++	++	+
Turmeric(Curcuma sp.)	+++	+	+	+	+
Ginger / Zingiber officinale	+++	+	+	+	-
Bread grass / (Brachiaria sp.	-	++	+++	+	-

Source: Gosai et al. (2010)

Efficiency in covering the function: "-" inefficient, "+" poorly efficient, "++" efficient, "+++" very efficient.

The sustainability of a farming system is primarily influenced by various factors including topography, annual rainfall, soil composition, nutrient availability, decomposition rates, and nutrient cycling, along with other climatic elements. A significant aspect that affects agricultural sustainability is the cultural practices of the Monpas, which are closely tied to their cultivation methods (Gosai et al., 2010). Sustainability is regarded as a dynamic objective that varies depending on both time and place. Consequently, a farming system currently deemed sustainable may become unsustainable in the future (table 2) if circumstances change (Simmons et al., 2005). Biodiversity in agricultural landscapes can play a significant role in determining their ecosystems and how lucrative the crop cropping system is. However, wild relatives of grown plants are not refined species and are a major generator of germplasm, being used to produce new crops and varieties (Power, 1999). Jhum farming systems in the rural valleys sustain a Monpas' agricultural system with soil and nutrients from surrounding hills. The topographically inclined farming tools in the valleys include Yak (or Bos grunniens), which till the ground through a wooden furrow on a traditional plough (Gosai et al., 2010). Horses, donkeys, and mules are used for transporting agricultural products and domestic items to the valley and hilltops. On the hills, they are fed rice straw while permitted to graze on grass that grows along hillsides and along edge of adjacent rice fields. Likewise, pigs, goats, chickens, ducks, etc., are raised and receive crop bran as well as other agricultural by products to feed. Pens for their livestock are set up around their kitchen garden, which aids in fertilizing the field with manure (Prakash S, 2003). Therefore, the indigenous people rely solely on their diverse agricultural practices without any external inputs like synthetic fertilizers, and this tradition has persisted throughout history.

Conclusion

According to research reports, loss of traditional knowledge is currently appearing as worrisome trends; loss of traditional knowledge may yield dire consequences for sustainability, especially with the traditional wisdom reported as risking the sustainability potential inherent in a region's existing ecological frameworks undergoing rapid transformations subjected to pressures imposed by tourism, climate fluctuations,

and evolving cultural dynamics impacting access and protection strategies pertaining to flora and fauna underpinning ethnic food systems retaining robust ethical foundations guiding harvesting and consumption norms. This necessitates urgent educational outreach initiatives aimed at fostering awareness regarding the importance of local support crops and engaging the community actively in conserving biodiversity and pertinent natural resource stewardship imperative for securing resilient futures for rural economies. (Warren DM, 1991). Consequently, policymakers and NGOs must advocate holistic participatory approaches instilling self-reliance and accountability among tribal populations shaping pastoral economic developments and improving sustainability prospects aligned with existing resource management frameworks. Underscored reliance on conventional hand tools supporting diverse agricultural activities remains foundational inputs, albeit challenges persist warranting assessments and redesign with mechanization advancements elevating operational efficiencies and mitigating physical burdens endured by operators, ultimately achieving increased productivity whilst safeguarding rich traditions carried forth by generations past, present, and future alike. This seamlessly integrates modern innovations respecting time-honored inherited legacies enriching lives and communities coexisting harmoniously with landscapes shaped by nurturing environments surrounding them, profoundly interconnected and interdependent relationships sustained through shared aspirations and collective efforts aimed at preserving valuable heritage passed down with cherished responsibilities upheld diligently, nurturing and safeguarding intrinsic qualities defining existence amidst ever-changing world contexts continuously evolving yet grounded and unyieldingly rooted in histories informing identities and shaping destinies unfolding ahead. Conventional hand tools utilized for different agricultural activities such as land clearing, weeding/intercultural operations, and harvesting demonstrate a sustainable foundation in crop production practices among the Monpas of Arunachal Pradesh. These tools are essential agricultural inputs, despite their limitations, including low output, high energy consumption, and significant physical strain on the user. While these tools are well-suited to the local agro-climatic and socioeconomic conditions, there is a real necessity to conduct studies for design alterations of these implements based on mechanical and economic factors to obtain increased field capacity, improved efficiency, and comfort during operation.

References

Berkes F, Colding J, Folke C. Rediscovery of traditional ecological knowledge as adaptive management. Ecol Appl. 2000; 10:1251-1262.

Maundu P. Methodology for collecting and sharing indigenous knowledge: a case study. Indigenous Knowledge and Development Monitor. 1995; 3(2):25-27.

Mondal M, Baruah KK, Rajkhowa C. Mithun: An Animal of Indian Pride. Livestock Research for Rural Development. 2014; 26(1).

Pandey NK, Chhonkar DS, Dhiraj K Singh, Sonam Tsering Khumu. Analysis of Indigenous Food Items of Monpa Tribal Community in Tawang District of Arunachal Pradesh, India. Int. J. Curr. Microbiol. App. Sci. 2017; 6(9):633-640.

Pimbert MP. Sustaining the Multiple Functions of Agricultural Biodiversity. Gatekeeper Series no. 88, The Sustainable Agriculture and Rural Livelihoods Programme, IIED, London, UK, 1999, 3-24.

Rakesh ES. Indigenous Technical Knowledge of Tribal Farmers of Arunachal Pradesh. Division of Agricultural Extension, IARI, New Delhi (Thesis), 2014.

Sarah L. Biodiversity and Traditional Knowledge: Equitable Partnership in Practice, (Earth scan Publication, London, UK), 2002.

Sedhain D. A study of the transhumant system of management of sheep in Rasuwa and Nuwakot districts. In: Tamang D, Gill GJ, Thapa GB (Eds.) Indigenous Management of Natural Resources in Nepal. Proceeding of the Workshop on Indigenous Management of Agriculture and Natural Resources. June 8-9, 1992, Dhulikhel, Nepal, 1993.

Singh A, Singh RK, Sureja AK. Cultural significance and diversities of ethnic foods of Northeast India, Indian J Traditional Knowledge. 2007a; 6(1):79-94.

Singh RK, Sureja AK. Community knowledge and sustainable natural resources management: Learning from Monpa tribe of Arunachal Pradesh, TD: J Trandisciplinary Res Southern Africa. 2006a; 2(1):73-102.

Singh RK, Brokpa Community. Indigenous knowledge of yak breeding and management by Brokpa community in eastern Himalaya, Arunachal Pradesh Indian J Traditional Knowledge. 2009; 8(4):495-501.

Singh RK, Singh A, Sureja AK. Traditional Foods of Monpa tribe of West Kameng, Arunachal Pradesh, Indian J Traditional Knowledge. 2007b; 6(1):25-36. Singh RK, Sureja AK. Conservation of Gymnocladus assamicus Kanj, A Critically Endangered Tree Species of Northeast India, Extension Bulletin No 1, College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh India, 2006c.

Singh RK, Sureja AK. Dynamics of traditional knowledge and prior informed consent of conservators of indigenous biological diversity of Northeast India, Proc Nat Seminar Nat Res & Tribal Comm Northeastern India, 7-8th February, Jawaharlal Nehru College, Rajiv Gandhi University, Pasighat, Arunachal Pradesh, India, 2006b.

Thresher P. Rural income from wildlife - a practical African model, Paper presented at African Forestry and Wildlife Commission, 10th Session, Kigali. (eds) Tiffen, M., Mortimore, M., and Gichuki, F., More People, Less Erosion: Environmental Recovery in Kenya, ACTS Press in association with ODI, Nairobi, 1992.

Turner NJ. Earth's Blanket Traditional Teaching for Sustainable Living, (Douglas & McIntyre Ltd Quebec Street Suite, Vancouver, British Columbia, Canada), 2005, 10-239.

UNEP-CBD. Consequences of the use of the new technology for the control of plant gene expression for the conservation and sustainable use of biological diversity. UNEP/CBD/SBSTTA/4/1/Rev.1. UN Secretariat of the Convention on Biological Diversity, University and Intermediate Technology Publications Ltd., London, 1999.

Warren D M & Rajasekaran B, Utilizing and Integrating Indigenous Knowledge Systems for Agricultural and Rural Development: Training Manual and Guide for Extension Workers, Technology and Social Change Program, (Iowa State University, Ames, Iowa), 1991, 10-15.

Pandey D N, Ethnoforestry: Local knowledge for sustainable forestry and livelihood security, Asia For Network and Himanshu, 1998, 5-10.

World Bank, Indigenous knowledge for development: A framework for action, Knowledge and Learning Centre, Africa Region, World Bank), http://www.worldbank.org/html/afr/ik/index/htm, 1998, 1-4.

Dasmann R F, The importance of cultural and biological diversity, in: Biodiversity: Culture, Conservation and Ecodevelopment, by Oldfield M L and Alcorn J B (Westview Press, Boulder), 1991, 7-15.

Prakash S, Nurturing traditional knowledge systems for development, Indigenous Knowledge Notes No. 61, (The World Bank, Washington D C), 2003, 1-4.

Gosai, K., Arunachalam, A., G.V Prasanna Kumar 2010. Indigenous Agricultural Management Practices in West Kameng District of Arunachal Pradesh in "Natural Resources Management in North East India" Eds. A. Arunachalam and L. Arunachalam, DVS Publishers, Guwahati pp.247-260

Simmons L., Rith L.P. and Soksithon, T. 2005. Diversifying small farms in Cambodia Leis India Vol., 7 No. 3 pp. 8-10

Power A.G., 1999. Linking Ecological Sustainability and World Food Needs, Environment Development and Sustainability Kluwer Academic Publishers Netherlands 1:185-196.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Patterns of Forest Cover Dynamics in Doboka Forest Reserve between 2014 to 2024 Using Landsat Satellite Data

Nabajyoti Nath[1*]

Accepted : 15 June, 2026

Abstract

The changes in forest cover in the Doboka Forest Reserve, located towards the south of Nagaon district of Assam in 2014 and 2024 were accessed using Landsat 7 ETM+ (2014) and Landsat 8 OLI (2024) satellite data. The main purpose of the study was to check out the temporal variations, if any of the forest cover in the forest reserve. The satellite images of 2014 and 2024 were classified using supervised classification into four different categories viz. dense forest, grassland, soil erosion area and water body. Based on maximum likelihood classifier and using standard accuracy assessment, the results showed that the area covered by grassland decreased from 2014 to 2024, while the area covered by dense forest increased from 2014 to 2024.Besides, the area of soil erosion has increased from 2014 to 2024.

*Correspondence :
Email: naba2768447n@gmail.com

[1]Department of Geography
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

These changes reflect the positive results coming out from conservation policies and afforestation efforts by primary stakeholders, the state forest department in the recent years where as the increase in soil erosion area has arisen a matter of concern.

Keywords Forest cover change; Doboka reserve forest; Satellite imageries; Supervised classification

Introduction

Undisturbed tropical forests provide numerous benefits, ranging from being carbon sinks to fulfill several social, economic and ecological functions (Rashid, Bhat, and Romshoo 2017; Sharma et al. 2022). They are, however being destroyed and degraded at unsustainable rates emanating from agricultural extensification and/ or urbanization expansion (Doyle, Beach, and Luzzadder-Beach 2021). Recent decades have witnessed deforestation rates to the tune of above 3 million hectares annually (FAO 2016). Deforestation is problematic, but tropical deforestation is far more worrying considering that the latter are storehouse of rich biodiversity (Phillips et al.2017). According to the United Nations Framework Convention on Climate Change (UNFCCC), 2001, "a forest is defined as an area of land between 0.05 and 1.0 hectares with a tree crown cover of more than 10-30% and trees with the ability to attain a minimum height of 2-5 meters at maturity in situ."

The study of forest cover change is one of the most important constituents of land use and land cover (LULC) change (Lele, Joshi 2009). The detection of land-use change and changes in forest cover enables the observation and evaluation of spectral and temporal variations that are happening within various environments (Mouat et al. 1993; Panuju et al. 2020). Since 1990 the world has lost 178 million ha of forest, at a rate of net forest loss of 4.7 million ha per year in 2010–2020 (FAO 2020). Conversion in forest class, such as from dense to open forest, is referred to as forest degradation because they entail detrimental impact on the site and reduce the production capacity (Dutca and Abrudan 2010). Ecological and social problems such as an increase in global warming, soil erosion, and biodiversity loss are caused by depletion in forest cover (Kaliraj et al. 2012).

Forest cover mapping helps in providing a constant delineation of land cover (Kumar 2011). In India, for forest cover assessment for the entire country is carried out every two years by the Forest Survey of India (FSI). For formulating various management strategies, a precise database relating to forest cover, forest

types, species composition as well as information of temporal changes in forest cover is required (Kaliraj et al. 2012; Karia et al. 2001; Kumar 2011). A regular observation of forest cover conditions is essential for detection and modeling of forest cover disturbances (Estreguil and Lambin 1996). For effective conservation management, it is crucial to ascertain the maximum amount of forest cover change that can be tolerated by wild wildlife communities (Corkery et al. 2020). Analysis of the cumulative impacts of changes in a landscape is vital for conserving sensitive habitats and environmental quality (Estreguil and Lambin 1996).

In recent years the use of remote sensing datasets has become indispensable to assess and monitor forest cover dynamics at regular intervals (Forkuo and Frimpong 2012; Sharma and Joshi 2013; Kaliraj et al. 2012; Lele and Joshi 2009). In remote sensing, the process of identifying differences over a geographical area by observing them at different times using multi-temporal data sets is known as change detection (Panuju et al. 2020; Singh 1989). Spatial distribution of forest resources, diversity conditions, and temporal changes can be analyzed and monitored using remote sensing and geographical information system (GIS) by combining spatial data with the other attribute databases (Kaliraj et al. 2012). By utilizing multi- temporal satellite imageries, the study aims to rectify the degree of forest cover change, identify the areas of deforestation and regeneration and evaluate the whole perspective of the forest reserve.

Study Area

The Doboka Reserve Forest in Assam is located in Hojai district and forms part of the Nagaon Forest division. Its coordinates are 92 ° 46′0″- 92 ° 57′0″ E longitude and 26 ° 6′0″- 26 ° 13′0″ N latitude. The total land covered area is about 117.51square kilometer and it is situated at an altitude of 106 m from mean sea level. To the north of the reserve forest is the Kafitoli hills, to the east of the reserve is the small Parokhowa town, to the south is the Doboka town, and to the west is the Kathiatoli town.

Methodology

Landsat 7 ETM+ images of 14 April 2014 and Landsat 8 OLI images of 2 April 2024 with almost zero percent cloud cover over the study area were used. All images with comparable calendar dates were chosen to reduce the seasonal effects on forest cover. The study made use of the combination of different bands (Band 1, 2,3, 4 and 5). This study used the maximum likelihood

classification (MLC) algorithm to run the classification, since this is known to give good results (Ahmed at al. 2022). Training samples were collected for each determined class (dense forest, grassland, and soil erosion area) and the spectral features of each class were examined. Following recent studies (Sharma et al. 2022) Google Earth was used to select training and testing sites during the process of running the classifications for 2014 and 2024 as well as during the accuracy assessment stage of the analysis. Therefore, by identifying a specific location in remotely sensed data that represents homogeneous examples of various land cover types, the study area is separated into three categories: thick forest, grassland, and soil erosion area.

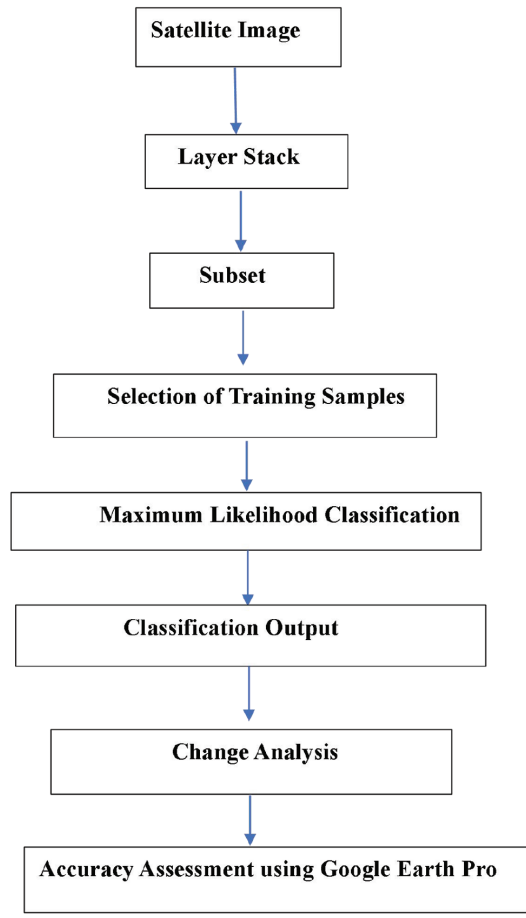

Figure 1: Flow Chart of Methodology. *Source : Authors' illustration*

Results and Discussion

Forest cover change between 2014 and 2024

Forest cover changes in the Doboka Forest Reserve from 2014–2024 showed that the most significant changes occurred in dense forest and grassland. In the year 2014, the total area covered by dense forest was 38.03 sq. km (32.37 %) of the study area. During 2024, dense forest increased to 75.21 sq. km (64.01%). Overall gain of dense forest from 2014-2024 was 37.18 sq. km (31.64%) with an annual gain of 3.74 sq.km (3.17 %). In the year 2014, the total area covered by grassland was 75.52 sq.km (64.27%) of the study area. During 2024, grassland decreased to 34.93 sq.km (29.71%). Overall loss of grassland from 2014-2024 was 40.09 sq.km (34.56%) with an annual loss of 4.06 sq.km (5.38%). Besides, the total soil eroded area of the forest reserve was 2.01 sq.km in 2014 which increased to 3.66 sq.km in 2024 (increase of 1.65 sq.km).

Table 1 : Change of Forest Cover during 2014-2024

Forest Categories	2014(%)	2014(sq.km)	2024(%)	2024(sq.km)	Changes in %	Changes (in sq.km)	Annual change (%)
Dense Forest	32.27	38.03	64.01	75.21	31.74	37.18	+3.17
Grassland	64.27	75.52	29.71	34.93	34.56	40.09	-5.38
Soil Eroded Area	1.70	2.01	3.13	3.66	1.43	1.65	+1.64

Source : Authors' calculation

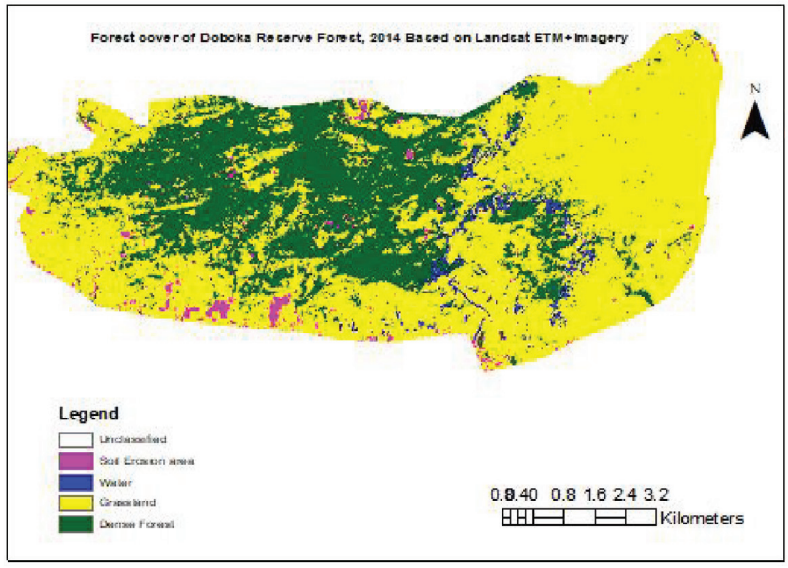

Figure 2 : Forest Cover during 2014. *Source : Authors' illustration*

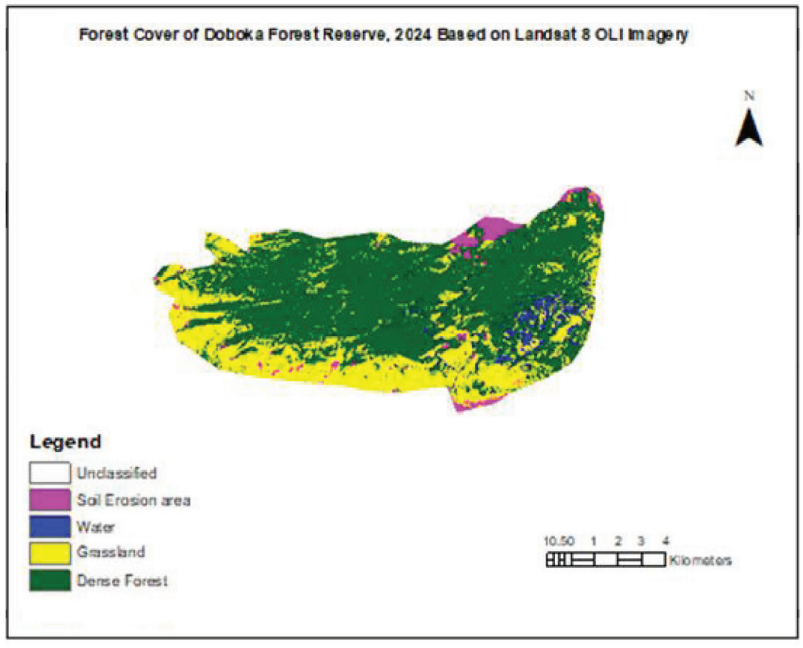

Figure 3 : Forest Cover during 2024. *Source : Authors' illustration*

Accuracy Assessment

Because of the complexity of digital image categorization and the introduction of increasingly advanced digital satellite remote sensing systems, the need for accuracy evaluation has risen (Congalton 1991). The Kappa Coefficient of Agreement was first proposed in the early 1980s as a measure to quantify the accuracy of an image classification used to create a thematic map (Congalton 1991; Foody 2020). For this study, the image classification of the year 2014 and 2024 has been used for accuracy assessment applying the method of kappa coefficient (k).

The overall accuracy of image classification for the year 2014 was 86.25% and overall kappa accuracy was 0.81. The overall Accuracy and Kappa accuracy assessment of image classification for the year 2024 is 90.83% and 0.88. Generally, accuracy assessments above 80 percent are considered acceptable in remote sensing assessments (Anderson et al., 1976)

Results and Findings

The process of forest cover change in the Doboka Reserve Forest over a 10-year period from 2014 to 2024 was measured using Landsat satellite images at an interval of 10 years. The various forest cover categories showed both gains and losses. In the year 2014, the total area covered by dense forest was 38.03 sq. km (32.37 %) of the study area. During 2024, dense forest increased to 75.21 sq. km (64.01%). Overall gain of dense forest from 2014-2024 was 37.18 sq. km (31.64%) with an annual gain of 3.74 sq.km (3.17 %). In the year 2014, the total area covered by grassland was 75.52 sq.km (64.27%) of the study area. During 2024, grassland decreased to 34.93 sq.km (29.71%). Overall loss of grassland from 2014-2024 was 40.09 sq. km (34.56%) with an annual loss of 4.06 sq.km (5.38%). Besides, the total soil eroded area of the forest reserve was 2.01 sq.km in 2014 which increased to 3.66 sq.km in 2024 (increase of 1.65 sq.km). The most evident and important gain that accrued was in the dense forest category. Additionally, grassland transitioned into dense forest. This is a healthy trend and is indicative of the improved conservation efforts by the state forest department as well as the support of local population groups that inhabit the fringe areas of the Reserve Forest. However, because of forest clearing and soil removal for the recently constructed four-lane highway, the area affected by soil erosion has increased from 2.01 square kilometers to 3.66 square kilometers is causing a matter of concern.

References

Ahmed, R., Saikia, A., & Robeson, S. M. (2022): "Tracks of death: Elephant casualties along the Habaipur–Diphu railway in Assam, India," Annals of the American Association of Geographers, 112(6), pp 1553–1575. https://doi.org/10.1080/24694452.2021.1990009

Basumatary, Sanswrang (2022): "Trajectories of forest cover change in Chakrashila Wildlife Sanctuary (India) between 2000 and 2020 using Landsat imagery," [Journal Name], Published online 20 December 2022.

Brown, D. G. (2003): "Land use and forest cover on private parcels in the Upper Midwest USA, 1970 to 1990," Landscape Ecology, 18(8), pp 777–790. https://doi.org/10.1023/B:LAND.0000014470.16973.cb

Chowdhury, R. R. (2006): "Driving forces of tropical deforestation: The role of remote sensing and spatial models," Singapore Journal of Tropical Geography, 27(1), pp 82–101. https://doi.org/10.1111/j.1467-9493.2006.00241.x

Congalton, R. G. (1991): "A review of assessing the accuracy of classifications of remotely sensed data," Remote Sensing of Environment, 37(1), pp 35–46. https://doi.org/10.1016/0034-4257(91)90048-B

Corkery, I., Irwin, S., Quinn, J. L., Keating, U., Lusby, J., & O'Halloran, J. (2020): "Changes in forest cover result in a shift in bird community composition," Journal of Zoology, 310(4), pp 306–314. https://doi.org/10.1111/jzo.12757

Dutca, I., & Abrudan, I. V. (2010): "Estimation of forest land cover change in Romania, between 1990 and 2006," Bulletin of the Transilvania University of Braşov, 3(52), pp 33–36.

Estreguil, C., & Lambin, E. F. (1996): "Mapping forest-cover disturbances in Papua New Guinea with AVHRR data," Journal of Biogeography, 23(6), pp 757–773. https://doi.org/10.1111/j.1365-2699.1996.tb00037.x

Forkuo, E. K., & Frimpong, A. (2012): "Analysis of forest cover change detection," International Journal of Remote Sensing Applications, 2(4), pp 82–92.

Foster, D. R. (1992): "Land-use history (1730–1990) and vegetation dynamics in Central New England, USA," Journal of Ecology, 80(4), pp 753. https://doi.org/10.2307/2260864

Indrabudi, H., De Gier, A., & Fresco, L.

O. (1998): "Deforestation and its driving forces: A case study of Riam Kanan watershed, Indonesia," Land Degradation and Development, 9(4), pp 311–322. https://doi.org/10.1002/(SICI)1099-145X(199807/08)9:43.0.CO;2-X

Kaliraj, S., Muthu Meenakshi, S., & Malar, V. K. (2012): "Application of remote sensing in the detection of forest cover changes using geo-statistical change detection matrices – A case study of Devanampatti Reserve Forest, Tamilnadu, India," Nature Environment and Pollution Technology, 11(2), pp 261–269. https://doi.org/10.1007/BF02989924

Karia, J. P., Porwal, M. C., Roy, P. S., & Sandhya, G. (2001): "Forest change detection in Kalarani round, Vadodara, Gujarat – A remote sensing and GIS approach," Journal of the Indian Society of Remote Sensing, 29(3), pp 129–135. https://doi.org/10.1007/BF02989924

Kumar, D. (2011): "Monitoring Forest cover changes using remote sensing and GIS: A global prospective," Research Journal of Environmental Sciences, 5(2), pp 105–123. https://doi.org/10.3923/rjes.2011.105.123

Lele, N., & Joshi, P. K. (2009): "Analyzing deforestation rates, spatial forest cover changes and identifying critical areas of forest cover changes in North-East India during 1972–1999," Environmental Monitoring and Assessment, 156(1–4), pp 159–170. https://doi.org/10.1007/s10661-008-0472-6

Mouat, D. A., Mahin, G. G., & Lancaster, J. (1993): "Remote sensing techniques in the analysis of change detection," Geocarto International, 8(2), pp 39–50. https://doi.org/10.1080/10106049309354407

Panuju, D. R., Paull, D. J., & Griffin, A. L. (2020): "Change detection techniques based on multispectral images for investigating land cover dynamics," Remote Sensing, 12(11), pp 1781. https://doi.org/10.3390/rs12111781

Rashid, I., Bhat, M. A., & Romshoo, S. A. (2017): "Assessing changes in the above ground biomass and carbon stocks of Lidder Valley, Kashmir Himalaya, India," Geocarto International, 32(7), pp 717–734. https://doi.org/10.1080/10106049.2016.1188164

Roy, P. S., & Joshi, P. K. (2002): "Forest cover assessment in north-east India – The potential of temporal wide swath satellite sensor data (IRS-1C WiFS)," International Journal of Remote Sensing, 23(22), pp 4881–4896. https://doi.org/10.1080/01431160110114475

Sharma, K., Saikia, A., Thapa, P., & Chettry, B. K. (2022):

"Aboveground biomass and carbon stock assessment in the Eastern Himalaya foothills along the Indo-Bhutan border," Australian Geographer, 53(3), pp 241–264. https://doi.org/10.1080/00049182.2022.2092992

Sharma, R., & Joshi, P. K. (2013): "Monitoring urban landscape dynamics over Delhi (India) using remote sensing (1998–2011)," Journal of the Indian Society of Remote Sensing, 41, pp 641–650. https://doi.org/10.1007/s12524-012-0248-x

Singh, A. (1989): "Review article: Digital change detection techniques using remotely-sensed data," International Journal of Remote Sensing, 10(6), pp 989–1003. https://doi.org/10.1080/01431168908903939

Talukdar, S., & Gupta, A. (2018): "Attitudes towards forest and wildlife, and conservation-oriented traditions, around Chakrashila Wildlife Sanctuary, Assam, India," Oryx, 52(3), pp 508–518. https://doi.org/10.1017/S0030605316001307

Forest Survey of India (FSI) (2021): State Forest report 2021, New Delhi: Forest Survey of India. https://www.fsi.nic.in

Food and Agriculture Organization (FAO) (2020): Global Forest resources assessment 2020: Main report, Rome: FAO. https://doi.org/10.4060/ca9825en

Anderson, J. R., Hardy, E. E., Roach, J. T., & Witmer, R. E. (1976): Land use and land cover classification system for use with remote sensor data (USGS Professional Paper 964), Washington, DC: United States Government Printing Office. https://doi.org/10.3133/pp964

Hegarty, S. (2022, July 11): "World Population Day: India will overtake China in 2023, says the UN," BBC News. https://www.bbc.com/news/science-environment-62126413

Fonseca, L. M. G., Namikawa, L. M., & Castejon, E. F. (2009): "Digital image processing in remote sensing," in Tutorials of SIBGRAPI 2009 – 22nd Brazilian Symposium on Computer Graphics and Image Processing, pp 59–71. https://doi.org/10.1109/SIBGRAPI-Tutorials.2009.13

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

The Integration of the Indian States : A Marvel in Statesmanship

Arani Saikia[1*]

Accepted : 15 July, 2026

Abstract

For modern India, Sardar Vallabhbhai Patel's vision, diplomacy and pragmatism are invaluable. His firm leadership played a pivotal role in the consolidation of the Indian Union after independence. As Home Minister and Deputy Prime Minister of independent India, Sardar Vallabhbhai Patel persevered to integrate several hundreds of princely states with the Union of India. Jodhpur, Junagadh, Kashmir, Hyderabad and Bhupal posed unsurmountable challenges which he overcame. He had a long-term view of the Indian nation. He realised that India was strong because of its variety and that a politically divided country cannot face the challenges of the modern world. Just because of his statesmanship and farsightedness, he was able to unite people of different views and keep the movement focused and united in the face of chaos. In barely two years, he accomplished the mission which

*Correspondence :
Email: draranisaikiahistory@gmail.com

[1]Department of History
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

was not easy to achieve i.e. political unification of India. He proved himself equal to the task. India, that is Bharat, shall be a Union of States as mentioned in the Article 1(1) of the Constitution of India became possible largely because of this one man.

This paper examines the pivotal role played by Sardar Vallabhbhai Patel in the territorial unification of post-independence India. Focusing on his remarkable political insight, diplomatic efforts, and firm administration, the study highlights how Patel's unwavering dedication was instrumental in shaping a united nation.

Keywords National integration; Political unity; Princely states; Instrument of accession

Introduction

Modern India is deeply indebted to Sardar Vallabhbhai Patel (31October 1875-15December 1950), whose foresight, diplomatic skill, and practical leadership unified more than five hundred and fifty princely states into the Indian Union. It safeguarded the newly independent country from fragmentation. To mark the 150th birth anniversary of Sardar Vallabhbhai Patel, the Government of India has launched a two-year nationwide programme (2024–2026) celebrating his pivotal role in shaping modern India and his enduring legacy as a symbol of national unity.

This paper explores Sardar Vallabhbhai Patel's crucial role in shaping India's post-independence unity and integrity, highlighting his political acumen, diplomatic strategies, and administrative firmness. This paper is restricted to understanding Sardar Patel's contribution in the territorial unification of India. The account of this visionary leader in shaping India's destiny with single-minded devotion is no less than a marvel.

Results and Discussion

In 1947, India emerged independent but faced immense challenges, including partition, communal violence, a refugee crisis, limited resources, weak institutions, and an outdated colonial administration. These factors made integrating hundreds of princely states an extremely difficult task for the new government.

As the first Deputy Prime Minister of India and Minister for States, Sardar Vallabhbhai Patel's role was crucial for the consolidation of India, as it involved dealing with internal security, law and order, and the political integration of the princely states. By 1946, he had established himself as a prominent leader

in India's freedom movement, having distinguished himself in the Kheda and Bardoli satyagrahas—achievements that earned him the title of 'Sardar.' Patel's legal training sharpened his analytical and negotiation skills, while Gandhi's philosophical influence shaped his commitment to non-violence and national unity. This blend of pragmatism and idealism guided Patel's pivotal role in India's independence movement and the seamless integration of princely states into a unified, sovereign Indian nation. Sardar Patel, who crafted the strategic framework, and the secretary of the Ministry of the States, V.P. Menon, who diligently executed the groundwork, persevered as an exceptional team. They swiftly undertook the integration of princely states, which accounted for nearly half of India's territory and over a quarter of its population. Although these states were technically independent, they remained under British control in practice.

Vallabhbhai Patel's approach to nation-building was defined by his long-term vision for India. Recognizing the country's inherent strength in its diversity, he understood that only a politically united nation could effectively confront the complexities of the modern world. His exceptional statesmanship and foresight enabled him to unify people with divergent perspectives and maintain a cohesive movement amid uncertainty and disorder. He prevented the balkanization of India and laid the foundation for a strong, cohesive union. Patel ensured that most of the princely states signed the Instrument of Accession and acceded to India. Known for his stoic demeanour and simple lifestyle, Patel was a man of few words whose presence commanded respect and attention whenever he spoke. He convinced the princely states to join the Indian Union with a liberal use of the carrot and stick policy. V.P. Menon noted that most of the princely rulers trusted Patel and appreciated his unfailing politeness towards them. Patel achieved the seemingly impossible task of integrating India in just two years. Any failure in this regard would have had severe consequences. This unprecedented political consolidation, achieved without widespread violence or prolonged conflict, remains a landmark achievement in world history. Autonomous and sometimes ancient chiefdoms had been dissolved into 14 new administrative units of India. He understood the importance of not only integrating the states politically but also ensuring their social, economic, and cultural integration. His approach to integration was clear and practical-

he focused on what was necessary to safeguard the unity of India.

Vallabhbhai Patel skillfully appealed to the princes' sense of patriotism, but also did not hesitate to underscore the risks of instability and disorder should they refuse integration. Moreover, by introducing the concept of "privy purses" as financial incentives for royal families, he demonstrated a willingness to compromise, balancing national interests with practical concessions to achieve long-term unity His ability to bridge gaps between various ideologies was a testament to his statesmanship, ensuring that the movement remained cohesive and focused amidst the chaos. The challenges faced during the integration of princely states into India were particularly pronounced with Jodhpur, Junagadh, Hyderabad, and Kashmir. Manipur and Tripura from the north-east region were also integrated with India. Each had unique circumstances requiring careful navigation.

In June 1947, as the transfer of power approached, Maharaja Hanvant Singh of Jodhpur reconsidered his predecessor's commitment to join India. His youth and inexperience led him to believe that aligning with Pakistan might offer better benefits due to geographical proximity.

In a striking move, Mohammed Ali Jinnah offered Hanvant Singh a signed blank sheet to fill with demands—ranging from access to Karachi's port facilities to arms manufacturing rights—should he choose accession to Pakistan. However, recognizing the strategic implications and potential unrest of this border state joining Pakistan, Sardar Patel intervened decisively. He reassured Hanvant Singh by promising rail connectivity between Jodhpur and Kathiawar and ensuring grain supplies during famines while allowing arms imports. Beyond these assurances lay more profound concerns: the accession of a predominantly Hindu state like Jodhpur to Pakistan would undermine the two-nation theory's core principle and likely incite communal violence.

Faced with these realities, Hanvant Singh reconsidered his position. The allure of Jinnah's offer was overshadowed by practical considerations and potential consequences for peace in his region. Ultimately, this thoughtful deliberation led Jodhpur to accede peacefully to India.

Junagadh was a mostly Hindu region in Gujarat. It had a Muslim ruler who chose to join Pakistan in 1947 angering the local population. The people revolted, the Nawab fled to Karachi, and a provisional government was established. Sardar Patel demanded a

plebiscite, but when Pakistan refused, he sent the Indian Army to annex Junagadh in November 1947. A plebiscite held in December showed that ninety nine per cent of the people wanted to join India, confirming the state's accession. In the meantime, on his way to Junagadh, Patel passed through Rajkot state. Its ruler, Thakore Pradyumnasinh conceded to the terms of Sardar Patel.

Kashmir had the majority of Muslim population with a Hindu king. It had remained reluctant to join either of the two dominions and posed challenges as it also shared international boundaries with Tibet, China, Pakistan and Afghanistan. After Pakistan's intentions in Kashmir became clear, Sardar Patel took swift action by securing transportation and communication links to the region and positioning the Indian Army strategically. When Pakistan invaded Kashmir with five thousand armed tribesmen in October 1947, the Maharaja Hari Singh signed the Instrument of Accession that V.P. Menon had proposed and sought India's military help pleading for life of Kashmir. The Indian Defence Committee, including Patel, authorized troops to drive out the invaders. Patel anticipated a prolonged conflict and addressed logistical challenges after road links were cut. He organized resources and labour to build a new road between Jammu and Pathankot, which was completed in eight months, facilitating military operations. Patel's determined leadership was instrumental in India's successful defence of Kashmir.

Hyderabad, the largest and wealthiest of India's princely states at the time of independence, spanned eighty two thousand square miles and was home to sixteen million people. Despite a predominantly Hindu population, political and administrative power remained concentrated in the hands of the Muslim Nizam and his elite. This arrangement highlighted the deep disconnect between governance and the demographic realities on the ground. Recognizing Hyderabad's importance and the potential for unrest, Vallabhbhai Patel offered the state a period of reflection after August 15, 1947, granting three months to decide its future. Sardar Patel insisted that decisions regarding Hyderabad should be handled solely by India, excluding any external involvement. This approach reflected Patel's preference for a negotiated transition, but also underscored the delicate balance between respecting princely autonomy and ensuring national unity during a turbulent period in India's history.

With Lord Mountbatten's agreement to this condition, discussions

with the Nizam proceeded, and Patel appointed K. M. Munshi to advocate for India's interests in Hyderabad. Initially, the Nizam assured he would not join Pakistan, which satisfied Patel. However, the situation deteriorated as the Razakars, an armed pro-Nizam group, launched violent attacks against the Hindu majority. The Congress viewed the situation as a fundamental conflict between democracy and autocracy. In response to the escalating unrest, Patel ordered 'Operation Polo'—a swift military action beginning on September 17, 1948. The campaign lasted just four days, leading to the Nizam's surrender and Hyderabad's integration into the Indian Union, over a year after independence. This episode underscored Patel's resolve to prioritize national unity and protect citizens from sectarian violence, while also demonstrating the limits of negotiation when faced with armed resistance.

By December 1947, the process of political integration across India advanced significantly through the merger of forty states into Orissa and the Central Provinces. Sardar Patel demonstrated considerable speed and determination in securing these mergers. In January 1948, he asserted that delaying the merger would have posed a serious risk and that missing such an opportunity would have been unwise.

The experience of Nilgiri, a small princely state embedded within Orissa, served as an early example of the possibilities and challenges of merging princely territories with the Indian Union. Lacking the resources, administrative capacity, and leadership needed for independent governance, Nilgiri faced growing pressure from the local Prajamandal movement demanding popular rule. Sensing both the limitations of his position and the changing political landscape, the raja of Nilgiri, after consulting with the Government of India, agreed to merge his state with the provincial administration of Orissa.

Sardar Patel, recognizing the broader significance of Nilgiri's decision, used it as a precedent to warn the rulers of other small states in Orissa and Chhattisgarh about the inevitability of integration. With forty-one princely states in the region—many rich in minerals, forests, and home to substantial Adivasi populations—Patel understood the delicate balance between central authority and local autonomy. He reassured the states that, post-merger, the Government of India would respect their autonomy in all matters except defence, external affairs, and communications, addressing anxieties over loss of local identity and control.

To further smooth the process, Vallabhbhai Patel and V.P. Menon advocated for tax-free privy purses to be granted to merging rulers, ensuring their financial security without compromising the new nation's unity. Patel also decided that initial responsibility for these states would rest with the central government before potentially delegating administration to the provinces. This thoughtful approach highlighted Patel's pragmatic statesmanship—combining firmness with reassurances and incentives—to bring diverse regions into the Indian fold while respecting their unique circumstances and concerns.

Sardar Vallabhbhai Patel's approach to integrating the Orissa and Chhattisgarh princely states into the Indian Union demonstrates both the strengths and ambiguities of India's state-building strategy. In Cuttack, Patel adeptly leveraged personal diplomacy, persuading the rulers of smaller states to surrender sovereignty by offering assurances of honour and privileges—an approach that combined pragmatism with political acumen. However, his negotiations with the larger states, notably Mayurbhanj and Patna, reveal the complexities inherent in balancing autonomy with national integration. While Mayurbhanj was temporarily granted special status due to its resources and size, Patel's underlying message was clear: merger was inevitable, and resistance would invite unspecified consequences.

This strategy, though effective in achieving rapid unification, raises critical questions about the degree of genuine choice afforded to the rulers. Patel's willingness to employ veiled threats highlights the limitations of voluntary accession and the use of pressure—moral or otherwise—as a tool of nation-building. The episode underscores the tension between the ideals of self-determination and the imperatives of political consolidation, casting Patel's legacy as both a masterful statesman and a hard-nosed unifier who prioritized national unity, sometimes at the expense of princely autonomy.

The Raja of Dhenkanal agreed to merge his state with India after receiving assurances from V.P. Menon, despite the absence of prior Cabinet or Prime Ministerial approval. Patel later secured retroactive endorsement for the merger. This successful negotiation facilitated the rapid integration of fourteen Chhattisgarh states, whose rulers signed merger agreements after meeting Patel in Nagpur on December 15.

After successfully integrating the princely states of Orissa and Chhattisgarh, Sardar Vallabhbhai Patel

turned his attention to the complex mosaic of Kathiawad, which comprised two hundred and twenty-two princely states of varying size and influence. Recognizing the region's economic strength and administrative promise, Patel envisioned the creation of a unified and stable political entity—the United State of Kathiawad. It would not only streamline governance but also foster democratic principles.

A pivotal moment in this process came with the Maharaja of Bhavnagar, whose state was the wealthiest and most prominent in Kathiawad. Guided by the counsel of Mahatma Gandhi and in consultation with Patel, the Maharaja made the consequential decision to forgo princely autonomy and join the proposed union. This act of leadership set a powerful example for other rulers in the region, signaling a shift from fragmented sovereignty to collective responsibility.

Patel's efforts in Kathiawad were marked by his unwavering commitment to both political unification and the establishment of representative institutions. By the end of December 1947, his vision had laid the groundwork for a democratic order in Kathiawad, demonstrating his belief that true integration required not just territorial consolidation, but the embedding of democratic values at the heart of India's new political landscape.

By early 1948, Sardar Vallabhbhai Patel and V.P. Menon had devised and executed a two-pronged approach to the integration of princely states—amalgamation with existing provinces and consolidation into new administrative unions. This dual strategy reflected both pragmatic adaptation to regional realities and a visionary reimagining of India's administrative map. In practice, the approach allowed for flexibility: where political, economic, and cultural affinities aligned, states were folded into larger provinces such as Bombay, Madras, and East Punjab. In regions marked by a multiplicity of small states and fragmented authority, new unions—like Himachal Pradesh and Rajasthan—were created to foster administrative coherence and political stability.

Tripura, an ancient state bordering Assam and East Pakistan (now Bangladesh), faced numerous challenges during integration with India after independence. With a seven-hundred-mile border adjoining Pakistan and virtually no direct road or rail links to Assam, Tripura's capital Agartala and other key regions were geographically isolated. Compounding these difficulties, Tripura faced a massive refugee

influx from East Bengal, straining its limited resources and administrative capacity. Addressing this vulnerability, the Indian government prioritized infrastructure development, notably the costly and ambitious Tripura Access Road, to establish vital connections with Assam and ensure the flow of essential supplies. With the ruler being a minor, administration was managed by his mother as Regent. Ultimately, the Regent signed the merger agreement in September 1949, and Tripura was officially integrated in the following month. This episode highlights how a combination of historical legacies, geopolitical realities, and humanitarian pressures shaped the integration of Tripura, necessitating both infrastructural innovation and diplomatic engagement.

Manipur's integration into the Indian Union was shaped by its strategic border location, complex demographic composition, and underdeveloped infrastructure. Spanning around eight thousand seven hundred square miles—most of which comprised hilly terrain inhabited by diverse tribal groups such as the Kukis and Nagas—Manipur presented distinct administrative challenges. Its borders with Burma (now Myanmar) and key regions of Assam and the Lushai Hills added to its geopolitical significance and complexity.

Given Manipur's peripheral position and limited development, the Indian government opted for direct administrative control by designating it a Chief Commissioner's province. The merger process was handled pragmatically: the Maharaja signed the agreement in September 1948, and the Indian government assumed control within a month. Key issues such as the privy purse and the Maharaja's private properties were resolved through negotiations led by Sri Prakasa, the Governor of Assam, in collaboration with the States Ministry. This approach reflects the government's focus on both diplomatic negotiation and administrative consolidation in integrating sensitive border states like Manipur.

A handful of states, either due to hesitation, uncertainty, or resistance, delayed signing the Instrument of Accession. The case of Piploda—a minor state that postponed its accession until March 1948—illustrates the complexities and lingering uncertainties that challenged the unification process. These exceptions highlight both the overall effectiveness of Patel's approach and the nuanced, state-specific obstacles that required continued negotiation and administrative persistence even after independence.

The integration process was not merely a bureaucratic exercise but a foundational act of statecraft. It reconfigured the subcontinent's patchwork of principalities into a more manageable system of governance and established a precedent for the future reorganization of states along linguistic and administrative lines. The formation of entities such as Patiala and East Punjab States Union (PEPSU) and the Matsya Union consisting of Alwar, Bharatpur, Dhaulpur, & Karauli signalled a willingness to experiment with new political arrangements, balancing the need for unity with the recognition of regional identities. Crucially, these efforts underscored Patel and Menon's understanding that political integration was inseparable from the challenges of governance and nation-building. By resolving the princely question through both incorporation and consolidation, they laid the groundwork for a more cohesive and governable India, setting the stage for subsequent reforms and the evolution of the federal structure. The territorial and administrative transformations accomplished during this period were therefore central to the emergence of a unified, modern Indian state. While Sardar Patel is well known for integrating major princely states into India, his swift action also ensured that Lakshadweep remained part of the country. After independence, Pakistan attempted to seize the strategically important islands, but Patel quickly dispatched Indian naval ships, thwarting their efforts and securing Lakshadweep for India.

By mid-1948, Sardar Patel's vision of a united India became a reality. Article 1 of the Constitution – 'India, that is, Bharat, shall be a Union of States'— captures the essence of a unified nation emerging from a mosaic of regions and identities. It is a testament to Sardar Vallabhbhai Patel's extraordinary vision and determination.

Conclusion

The merger of princely states with India is a significant historical event deserving appreciation. The ever-pragmatic Vallabhbhai Patel and his brilliant secretary accomplished the monumental task of unifying the princely states into the Indian union. Through his unwavering commitment to national integration, Patel not only brought together hundreds of princely states but also laid the foundation for a strong, cohesive India. Most rulers dissolved their states and transferred control of thousands of villages, jagirs, palaces, institutions, vast cash reserves, and a twelve-thousand-mile railway network

to the Indian government. There was no sort of compensation. Their contribution achieved territorial integration and provided resources needed to build modern India.

This paper reaffirms Sardar Vallabhbhai Patel's status as a master statesman, whose vision and execution were essential in shaping modern India's political and administrative landscape. His commitment to national unity over personal or political gain established a precedent in Indian politics and laid the foundation of the country's federal structure. As India faces challenges of unity, governance and development in rapidly changing, pluralistic societies, Patel's principles in fostering cohesion, stability, and resilient institutions remain deeply relevant. On the 150th birth anniversary of Sardar Vallabhbhai Patel, his legacy of unifying diverse princely states remains a source of inspiration and gratitude for generations to come.

References

Gandhi, Rajmohan (1991): *Patel: A Life,* Ahmedabad: Navajivan Publishing House.

Guha, Ramachandra (2008): *India After Gandhi: The History of the World's Largest Democracy,* London: Picador.

Menon, V.P. (1955): *The Story of the Integration of the Indian States,* London: Lomgmans, Green and Co.

Sanyal Sanjeev and Rajesh Singh (2024): Iconic Indians: 75 *Extra Ordinary Individuals Who Inspired the Country,* New Delhi: Rupa Publications.

Tripathi, S.N. and Saket Bihari (eds) (2021): *Sardar Patel-Builder of Aspirational India,* New Delhi: Indian Institute of Public Administration.

Watson, Francis (1974): *A Concise History of India,* London: Thames and Hudson.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Colonial Fiscal Policies and the Transformation of Traditional Authority: A Study of Revenue Administration in Upper Assam (1826–1857)

Sandeep Kumar Thakur[1*]

Accepted : 11 June, 2026

Abstract

This study examines how colonial revenue policies transformed the condition of traditional authority in Upper Assam between 1826 and 1857. For nearly six centuries, the Ahoms governed the Brahmaputra Valley through the Paik and Khel systems, which were based on personal service rather than land revenue. However, after internal conflicts such as the Moamoria Rebellion and the Burmese invasions, the Ahom kingdom came to an end with the Treaty of Yandabo in 1826. Following this, the English East India Company replaced the traditional paik system with a land revenue system, abolished older taxes, discontinued the Kheldari system, and introduced the Mouzadari system. It also imposed taxes on revenue-free classes, including members of the Ahom royalty and nobility. These fiscal

*Correspondence :
Email: sandipthakur8@gmail.com

[1]Department of History
Chilarai College, Golakganj, Assam-783334

Published offline : 7 August

reforms weakened the traditional Ahom authority by reducing their power, privileges, and administrative roles. The study explores how these colonial fiscal measures reshaped the social, economic, and political foundations of traditional authority in Upper Assam, which had been primarily sustained by the Ahom royalty and nobility.

Keywords Ahom; Nobility; Paik; Khel; Land revenue

Introduction

The Ahoms, who ruled a large part of the Brahmaputra Valley for nearly six centuries from the early 13th century until the annexation of their kingdom by the East India Company in the early 19th century, constituted the traditional authority of Assam. During their rule, the Brahmaputra Valley experienced socio-political unification. Their administrative system, founded on the Paik and Khel system, was distinctive in that it did not depend on a system of land revenue. Instead, it relied on personal service, where every able-bodied male (paik) was required to render free-services to the state in rotation. This personal service-based system sustained the administrative, military, and economic needs of the Ahom state without a proper land revenue system (Gohain 1999: 114-127). However, by the late eighteenth and early nineteenth centuries, the Ahom state began to decline due to a series of internal disturbances and external invasions. The prolonged Moamoria Rebellion (1769–1805) weakened the royal authority, and the successive Burmese invasions further destabilized the kingdom. These developments culminated in the Treaty of Yandabo (1826), which brought Assam under the control of the English East India Company (Bhuyan 1933: 216).

Yet, the Ahom monarchy did not immediately disappear. Two years later, in 1828, Lower Assam was annexed to Company territory, while Upper Assam was restored to the Ahom monarch Purandar Singha in 1833. In 1838, Upper Assam too was annexed, marking the complete end of the rule of the Ahoms. The annexation of Upper Assam led to the introduction of new fiscal policies by the Company administration. A formal revenue collection system replaced the traditional Paik system, fundamentally altering the economic foundation of the state. This study seeks to explore how these colonial fiscal policies transformed traditional power structures in Upper Assam, particularly focusing on the changing position of the Ahom nobility between 1826 and 1857.

David Scott's Experiments in Revenue Administration (1826–1831)

The introduction of a systematic revenue administration in Assam posed a major challenge to the English East India Company from the very beginning of its rule in 1826. During the Ahom period, there was no system of land revenue collection in Upper Assam. Instead of paying land revenue, the Ahom state relied on the personal service of paiks. While certain professional groups, such as the Sonowals, were subject to profession taxes, the peasantry was exempt from any form of land tax. Their primary obligation to the state was to render personal service as paiks. The Ahom nobility played a crucial role in the functioning of the paik system. Members of the nobility were appointed as Kheldars to administer the Khels and were granted tracts of land along with paiks for the maintenance of their establishments. The Khels were essentially occupational guilds, each specializing in the production of particular goods or services, and were subdivided into gots comprising four paiks.[1] Initially, a got consisted of four paiks, but during Rajeshwar Singha's reign, the number was reduced to three. Every paik received two puras of rupit land for household maintenance.[2] Rupit land refers to good-quality cultivable land. Each Khel produced its specialized items for its respective Kheldar, who in turn was required to supply manpower from among his paiks to the Ahom king for military or civil duties. The Kheldars also exercised limited judicial authority within their respective Khels, making the system both administrative and socio-economic in nature (Robinson 2011: 206-207).

When the English East India Company occupied Assam in 1826, David Scott served as the Senior Commissioner & Agent to the Governor-general in Assam. Although he introduced minor modifications to the traditional revenue structure of Upper Assam, he did not immediately abolish or replace the existing institutions such as the Khel system. The executive framework of the Khel continued to function, albeit with certain administrative adjustments. One of the significant changes introduced during this period was the abolition of the paik system of personal service and its replacement with a capitation tax imposed on the former paiks. Despite this modification, the Khel organization persisted as the administrative unit responsible for supervising the gots and maintaining control over the paik population under the emerging colonial order. The amount of capitation tax was fixed at Rs. 9 per got or Rs. 3 per paik

(Mills 1984: 3). Janardan Barbarua, a former Ahom noble who was related to the family of the late Ahom king, Gaurinath Singha, was appointed to head of the revenue department. He was assigned to collect revenue in Upper Assam, and the Kheldars viz. Hazarikas, Saikias and Borahs helped him with this (Lahri 1954: 56). The imposition of the uniform capitation tax on paiks had a major drawback. In this taxation system, everyone, rich or poor, was charged equal revenue (White 1832: 22). This meant that peasants with low-quality cultivable land had to pay the same amount of revenue as those with high-quality land because the tax was imposed on the people rather than the land. It should be noted that the British did not initially abolish the paik system. Therefore, the paiks at the same time were also assigned to serve their masters or work for the production of their respective Khels, as in earlier days. The British even assigned some paiks to officers or nobles who were now appointed by the government to handle the administrative duties. Janardan Barbarua, the head of the revenue department of Upper Assam, was one such noble. He was paid in terms of land and paiks (Bhuyan 1990: 564). Most of the other revenue and judicial officers from the Ahom period were reinstated, and they were also paid in terms of land and paiks.

Revenue Administration under Purandar Singha (1833–1838)

After the restoration of Upper Assam to the Ahom monarch Purandar Singha in 1833, no major changes were introduced in the revenue structure of the region. The reforms implemented by David Scott continued to remain in force. Each paik of a Khel was charged the same rate as fixed earlier by the colonial authorities i.e. Rs. 3 as a capitation tax in exchange for two puras of rupit land (Bhuyan 1932: 195) (Lahari 1954: 171). However, certain modifications were introduced in the method of land revenue collection. The revenue settlement was initially made for a period of three years with the Kheldars. In return for collecting revenue from their respective Khels, the Kheldars were allowed to retain a small portion of the total revenue as remuneration. They also received a number of paiks for their personal service and maintenance. Although the Khel system was revived, the Kheldars no longer enjoyed the same autonomy and privileges as before. They were now primarily responsible for revenue collection from the paiks, and failure to perform this duty could lead to their removal from office (Banerjee 1990: 87).

The Kheldars were required to reside within their respective Khels to ensure smooth functioning of the system. They were not permitted to leave their post without appointing a deputy to act on their behalf. Their tenure in office was contingent upon timely payment of revenue to the king. To meet the administrative demands of the new regime, it was also made mandatory for the Kheldars to acquire basic literacy. Consequently, a number of schools were established by the Kheldars for learning reading and writing. It was further stipulated that after a period of three years, revenue settlements would be concluded only with those Kheldars who were literate. In the absence of qualified candidates from the nobility, the office of Kheldar could be conferred upon any competent individual, irrespective of birth or social rank. Another significant change in the revenue administration during this period was the introduction of the Mouzadari system on the north bank of the Brahmaputra and in areas east of the Jhanzi River.[3] This reform was implemented under the direction of the Political Agent, Captain White, and approved by the king (Barpujari 1977: 32). As a result, several Kheldars from the north bank lost their traditional offices and privileges, marking a gradual transition from the older Khel-based structure to a new system of territorial revenue administration.

Administrative Reorganization of Upper Assam after the Annexation

After the annexation of Upper Assam in 1838, the Chief Commissioner of Assam, Captain Francis Jenkins, appointed Captain White as the Political Agent of Upper Assam on 16 September 1838. His primary responsibility was to look after the administrative, revenue, and military affairs of Upper Assam. One of Captain White's earliest administrative measures was the division of Upper Assam into two districts, Sibsagar and Lakhimpur. These were placed under the charge of two Principal Assistants: Lieutenant Brodie and Lieutenant Vetch, respectively (Barpujari 1963: 124). The Sibsagar district, which now encompasses the present-day districts of Sibsagar, Charaideo, Jorhat, Majuli, and Golaghat, constituted the core area of the former Ahom royalty and nobility. The foremost responsibility before these Principal Assistants was to reorganize and stabilize the revenue administration of their respective districts. In pursuit of this objective, both Brodie and Vetch initiated separate measures to reform the revenue system. During the initial years following annexation,

there was no uniform revenue policy implemented across Upper Assam; instead, district-wise reforms were undertaken independently according to local conditions.

Revenue Reforms in the Sibsagar District

In 1840, Mr. Thornton, the Sub-Assistant Commissioner of Sibsagar and a European land surveyor, was appointed to carry out a detailed land survey in the district (Barpujari 1963: 148). The main objective of this survey was to examine the existing pattern of landholding and to assess the revenue potential of the region. Earlier, the area had functioned under the Paik system and a capitation tax imposed on the paiks during David Scott's reforms, but no proper land revenue system had been introduced under the earlier colonial revenue measures. Based on Thornton's survey, Lieutenant Brodie, the Principal Assistant of the Sibsagar district, implemented a series of administrative and revenue reforms. These measures aimed to establish a proper revenue structure by identifying cultivable land, standardizing assessments, and integrating the traditional Khel and village units into the new colonial fiscal system. One of Brodie's key revenue reforms was the replacement of capitation tax with land revenue that varied from eight annas to one rupee per pura, which he further increased by twelve annas on the non-rupit land and one rupee and four annas on the rupit land in 1843-44. In addition to replacing the capitation tax, he also abolished customs duties such as the hat tax (Market tax) and the ghat tax (tax imposed on fishing). However, with the introduction of land revenue in the districts, the revenue-free lands such as Khats and Bari lands came under the revenue assessments (Barpujari 1963). The Khats were essentially nobles' estates that they had enjoyed as revenue-free grants for centuries, and the baris were lands that were used for homesteads or gardens by the paiks as well as the nobles. Initially, the revenue was imposed on both lands at 8 annas per pura, but it was later increased by 50% (Dutta 1990 :117). There were two major reasons behind the imposition of the land revenue on these lands by Bordie. First, it would help to generate more revenue because the majority of the cultivated fields in the district were revenue-free grants under the nobles. Thus, the imposition of revenue on such grants would naturally increase revenue collection in the district. Second, the imposition of land revenue on these lands, especially bari lands, would encourage their conversion into cultivable fields for cash crops. In

the opinion of Jenkins,

"when the people will find that they will have to pay for them (bari) they will consider to what advantage they can turn them." (Barpujari 1977: 52)

Meanwhile, the Kheldari system was abolished, and a new system was implemented in the Sibsagar district. According to that, the whole district was divided into 51 tanganis (fiscal units) (Neog 1977: 35). The Ahom nobles, such as the Phukan, the Rajkhowa, and the Barua, were placed in-charge of the collection of revenue in the tanganis in exchange for 14% commission on total revenue collection in their respective tanganis. In their work, they were assisted by Hazarikas, Saikias, and Borahs. However, this system was eventually replaced by the Mouzadari system in 1840–1841. As per the settlement, the Sibsagar district was further divided into 130 mouzas and placed under the authority of the mouzadars (Mills 1984: 505). In the words of H.K. Barpujari, the mouzadars were to be men of "respectability and character," but not necessarily members of the old Ahom nobility (Barpujari 1963: 150). Generally, this office was given to the inhabitants of Marwar and educated Bengalis from Sylhet (Dewan 1984: 607). The primary responsibility of the mouzadars was to collect revenue in their respective mouzas. In return, they received an 8% commission on the gross revenue collection and were given one pura of revenue-free land for every hundred puras of cultivated land under their mouzadarships (Mills 1984: 505). Each mouzadar was allotted subordinate officers to assist them, such as a Sadhani, or headman, who worked for 5% commission and six puras of revenue-free land; a Kakati, who worked for 2% commission and half a pura of revenue-free land for every hundred puras of cultivated land; and a Tekela, who served for 5% commission and five puras of revenue-free land (Neog 1977: 35). Initially, the settlements were made with the mouzadars for one year, but later changes were made to the duration of the settlement. The new period of the settlement was not uniform. It varied from one mouza to the next (Mills 1984: 595).

Assessing the Impact on Traditional Authority

The revenue reforms introduced during the early colonial period had a deep impact on the traditional Ahom authority. The imposition of land revenue on khats, the abolition of the Kheldari system, and the introduction of the Mouzadari system in the Sibsagar district

brought major changes to the existing administrative and socio-economical structure. During the time of Purandar Singha, the Mouzadari system had already been introduced on the northern bank of the Brahmaputra, which caused the gradual loss of employment for many Ahom nobles who had earlier held traditional positions. In contrast, the Kheldari system continued to exist in Sibsagar during his rule, keeping parts of the old Ahom structure intact. However, in 1840–41, this system was completely replaced by the Mouzadari system in Sibsagar, the main centre of traditional Ahom authority. This change led to the loss of livelihood for most Ahom nobles who depended on the Kheldari system, while only a few were included in the new colonial system as mouzadars.

The subordinate officers of the Ahom nobles were not removed from their administrative designations. They were now appointed to assist the mouzadars in their work. According to Brodie, the subordinate officers of the Ahom nobles, such as the Boras, the Saikias, and the Hazarikas, were more capable than Ahom nobles like the Baruas and the Phukan (Barpujari 1963: 150). However, this was very frustrating for the Ahom nobility because their subordinates were able to secure employment in the new regime, but at the same time, senior nobles lost their employment. Simultaneously, the imposition of land revenue on Khats, which were previously revenue-free and hereditary estates of the Ahom nobles, also increased the financial burden of the nobility. It was made mandatory for them to pay land revenue to the state like common peasants. The nobles, being members of the landlord class, hold the vast tracts of land in Assam. Therefore, they had to give a large amount of land revenue to the colonial government as per the new land revenue policy. For example, Maniram Dewan had to give Rs. 500 as the land revenue (Dewan 1984: 604). In the words of Maniram Dewan,

"Under the revenue settlement (mouzdari)…respectable Assamese are out of employ, the inhabitants of Marwar and Bengaless… appointed to Mouzadarship; and for us respectable Assamese to become the ryots of such foreigners…" (Dewan 1984: 604)

However, as a relief measure, some members of the old Ahom nobility and royal family were granted pensions or financial assistance in terms of money and land, but the numbers of beneficiaries were very small and restricted to only an influential section of the old nobility (Saikia 2000: 37). For, example, the ex-king, Purandar Singha was offered a pension of Rs. 1000 per annum in the

wake of the annexation of Upper Assam, but he refused to accept the pension in the hopes that his kingdom would be restored (Banerjee 2007: 103-04). In this respect, he made several requests to the colonial authorities, asking them to return Upper Assam to him. But, the authorities ignored all his requests. After giving up all hopes, Purandar Singha was compelled to ask for the Zamindarship of Jorhat and a pension of Rs. 1500 from the Governor-General in July 1845. The government, on the other hand, agreed to give him only the previously sanctioned amount of Rs. 1000 per annum as a pension, which was the highest amount offered to any member of the Ahom royal family or nobility. However, Purandar Singha died on October 1, 1846, before he could receive the pension amount (Barpujari 1963: 155-56). After his death, his wife and sons received a pension of Rs. 960 per annum from the colonial government (Mills 1984: 592-593). Another ex-king, Chandrakanta Singha, was also granted a pension of Rs. 500 at the time of the restoration of Upper Assam in 1833. After his death in 1839, his pension was transferred to his elder son, Jubaraj Ghanakanta Singha (Barpujari 1963: 1971).

Besides these measures, the English East India Company also provided grants for royal marriages and the repair of royal houses. The queen mother of the former king Rajeswar Singha received a grant for her granddaughter's marriage (Jenkins: 1838). In 1852, the queen mother of Purandar Singha was granted Rs. 100 to repair her house (Dutta 1990: 141). However, there were numerous other instances where the colonial authorities granted pensions or financial assistance to nobles and members of the royal family (Mills 1984: 592-593). But still it was limited to influential section of the nobility. Most of the members didn't get any benefit from the pension scheme of the colonial government. Even the pension amount was insufficient to run their establishments. Ramkumar Vidyaratna, a Bengali traveler who visited Assam in the 19th century, wrote about the difficulties of the Ahom nobles and the royal families. During his visit to Guwahati, he went to see the royal houses with Kandpeswar Singha, who was stationed at the town by the colonial government and given a pension of Rs. 500. Vidyaratna reported that the royal houses and houses of the nobles were in such terrible conditions in the town that no one reorganized them as houses of the upper class (Vidyaratna: 2014: 16). He further concluded that the royal families lacked the means to sustain themselves, and the pensions provided by the colonial government were far from adequate to support their livelihood.

Conclusion

The Colonial intervention in Upper Assam between 1826 and 1857 brought significant changes to the traditional authority of the region. The old Paik labour system, which had supported the Ahom state for centuries, was replaced by a new land revenue system. This shift changed the social and political structure of the region. What was once a system of mutual service and duty between the ruler and the people became a system of taxation controlled by colonial officials. Through the reforms introduced by administrators like David Scott, Captain Jenkins, and Lieutenant Brodie, the traditional Khel and Kheldari systems were abolished. The new Mouzadari system, the taxation of revenue-free lands, and the loss of noble privileges together weakened the Ahom royal family and nobility. Many who once held power and wealth were reduced to pensioners under British rule. Although some grants and pensions were given to a few influential nobles, these were limited and often insufficient. Most of the Ahom elites faced financial difficulties and loss of status. Nineteenth-century observers like Ramkumar Vidyaratna also noted the deteriorating conditions of the Ahom nobility during this period.

Overall, the colonial revenue reforms not only reshaped the economy of Upper Assam but also destroyed its traditional structures of authority. The decline of the traditional Ahom authority marked the beginning of a new order shaped by colonial fiscal and administrative reforms. However, in the long run, the colonial system also created new opportunities for sections of the traditional elite, enabling some to adapt and sustain themselves within the changing order. This aspect, however, remains open for further research to understand the adaptive strategies of traditional authority under colonial rule.

Endnotes

[1]Initially, a got consisted of four *paiks*, but during Rajeshwar Singha's reign, the number was reduced to three.

[2]*Rupit* land refers to good-quality cultivable land.

[3]The *Mouzadari* System was a revenue system in which districts were divided into mouzas (circles), each placed under a mouzadar responsible for collecting revenue from the peasants.

References

Banerjee, A.C. (2007): "Ahom Monarchy in Upper Assam 1833-38," H.K. Barpujari (ed.), The Comprehensive *History of Assam,* Vol. IV, Guwahati: Publication Board Assam.

Barpujari, H.K. (1963): *Assam in the Days of the Company, 1826-1858,* Gauhati: Lawyer's Book Stall.

— (1977): Political History of Assam, 1826-1919, Vol. I, Gauhati: Department for the Preparation of Political History of Assam (Government of Assam).

Bhuyan, S.K. (1932): *Asamar-Padya-Buranji,* Gauhati: DHAS.

— (1933): *Tungkhungia Buranji, 1681-1826 A.D.,* Calcutta: Oxford University Press.

— (1990): *Anglo-Assamese Relations, 1771-1826: A History of the Relations of Assam with the East India Company from 1771 to 1826, Based on Original English and Assamese Sources,* Gauhati: Lawyer's Book Stall.

Dewan, Moneeram Borwah (1984): *"Translation of a Petition Presented in Person by Moneeram Dutt Borwah Dewan, on Account of Ghunnokanth Sing Joobaraj* and Others". Appendix –kb, Report on Sibsagar, in A.J. Moffatt Mills, Report on the Province of Assam, Gauhati: Publication Board Assam.

Dutta, Ajit Kumar (1990): *Maniram Dewan and the Contemporary Assamese Society,* Guwahati: Jyoty Prakashan.

Gohain, U.N. (1999): *Assam under the Ahoms,* Guwahati: Spectrum Publications.

Jenkins, Captain F. (1838): A Journal of Upper Assam Tour.

Lahari, Rebati Mohan (1954): *The Annexation of Assam,* Calcutta: General Printers & Publishers Limited, Calcutta.

Mills, A.J. Moffatt (1984): *Report on the Province of Assam,* Gauhati: Publication Board Assam.

Neog, Maheswar (1977): *Anandaram Dhekiyal Phukan: Plea For Assam and Assamese,* Jorhat: Assam Sahitya-Sabha.

Robinson, William (2011): *A Descriptive Account of Asam,* Guwahati: Bhabani Print & Publications.

Saikia, Rajen (2000): *Social and Economic History of Assam,* 1853-1921, New Delhi: Manohar Publishers & Distributors.

Vidyaratna, Ramkumar Vidyaratna (2014): *Udasin Satyasrabar Asom Bhraman,* (trans.) Pradip Kumar Assam, Guwahati: Publishing Company.

White, Adam (1832). *A Memoir of Late David Scott,* Calcutta: The Baptist Mission Press.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Administrative Hierarchy in Early Kamarupa (4th-12th Centuries): An Epigraphic Reconstruction

Chiranjib Dahal[1*]

Accepted : 11 July, 2026

Abstract

The administrative units of Early Kamarupa (4th to 12th Centuries CE), as reflected in its inscriptions and literature, reveal a sophisticated and evolving state structure. The system was hierarchical, moving from the largest territorial division down to the individual village, and it shows a blend of indigenous terms and the adoption of classical Sanskritic administrative nomenclature. Polity and administration are intrinsically linked. Polity defines the nature of the state and its components, while administration is the machinery that carries out governmental functions to preserve the state and ensure public welfare. The Kamarupa kingdom was divided into several administrative units as a part of administrative machinery like its Indian counterpart, though there are variations in the terms and geographical units. A study of the administrative apparatus of Early Kamarupa is crucial to understanding it's political integration and economic vitality.

*Correspondence :
Email: chiranjibdahal@gmail.com

[1]Department of History
JDSG College, Bokakhat, Assam-785612

Published offline : 7 August

Keywords Kamarupa; Administration; Inscriptions; Bhukti; Mandala; Vishaya

Introduction

The early Kingdom of Kamarupa, rooted in ancient land of *Pragjyotisha* mentioned in the Ramayana and the *Mahabharata,* holds a pivotal place in the historical geography of Northeast India. While its name evolved over time, the geographical extent of this kingdom was not fixed, fluctuating with its political fortunes. It's significance is further illustrated in the *Kalika Purana,* which describes how, after Naraka of Mithila became king and was entrusted with the goddess Kamakhya, the land's name was changed from *Pragjyotisha* to Kamarupa. The earliest epigraphic reference to Kamarupa is found in the well-known Allahabad inscription of Samudragupta where Kamarupa is noted as a frontier territory. From approximately the 4th century CE until the first half of the 13th century CE, the Kamarupa kingdom was ruled by a succession of dynasties- the Varmans, the Salastambhas and the Palas, in chronological order. The unified kingdom collapsed around the mid-12th century leading to a period of fragmentation before the eventual rise of the Ahom Kingdom. In this paper attempt has been made to trace the administrative units of early Kamarupa during the reign of these ruling dynasties.

The administrative units of Early Kamarupa (4th to 12 Centuries CE), as reflected in its inscriptions and literature, reveal a sophisticated and evolving state structure. The system was hierarchical, moving from the largest territorial division down to the individual village, and it shows a blend of indigenous terms and the adoption of classical Sanskritic administrative nomenclature. Polity and administration are intrinsically linked. Polity defines the nature of the state and its components, while administration is the machinery that carries out governmental functions to preserve the state and ensure public welfare. The Kamarupa kingdom was divided into several administrative units as a part of administrative machinery like its Indian counterpart, though there are variations in the terms and geographical units.

Objectives of the Study

The prime objective of this paper is to systematically reconstruct and analyze the structure, hierarchy and functionality of the administrative units within the Early Kamarupa kingdom from 4th to 12th century by synthesizing epigraphic, literary and historical evidence.

Methodology of the Study

This study employs a multi-disciplinary and critical historical

research methodology, combining traditional textual analysis with comparative and conceptual frameworks. It employs a comprehensive survey of all published copperplate inscriptions and key data also extracts from these inscriptions. This methodology ensures that the study is not merely descriptive but also analytical and interpretive, providing a comprehensive understanding of how the Early Kamarupa kingdom was governed.

Review of Literature

The study of Early Kamarupa's administration is a field built primarily on the critical analysis of copperplate inscriptions, supplemented by literary texts and comparative historical models. The foundational evidences come from the land-grant inscriptions of the ruling dynasties of the period under study. But these inscriptions provide concrete, albeit often isolated, data points. They provide fragmentary evidence. Literary sources provide a different, more ideological perspective. The Kalika Purana compiled within Kamarupa, offers a theological and cultural model of administration. It emphasizes the king's divine role as a patron of Brahmins through Agrahara land grants and defines the kingdom's sphere through sacred geography. External sources like Accounts of Hiuen Tsang and Harshacharita of Banabhatta corroborate the kingdom's prosperity and the sophistication of its court, implying the existence of a robust administrative system to support such a state, even if they do not detail its units. Historians have worked to synthesize this evidence into coherent models. K. L. Barua approached the history of Kamarupa with a focus on systematic reconstruction from primary sources, primarily copperplate inscription. Scholars like B. N. Puri have systematically organized the units into a descending hierarchy. This model provides a clear, structured framework for understanding the state's organization. B.K. Barua in his *A Cultural History of Assam* is characterized by a clear, evidence-based approach that relies heavily on epigraphic sources to reconstruct the territorial organization of the kingdom. The perspectives of P. C. Choudhury on Kamarupa administration, as detailed in his seminal work T*he History of the Civilization of the People of Assam to the Twelfth Century AD* provides a comprehensive and systematic analysis that builds upon the foundations laid by earlier historians like K.L. Barua. His work is characterized by its meticulous synthesis of epigraphic data to present a coherent picture of the state's structure. Nayanjot Lahiri in his Pre-Ahom Assam sees the hierarchical system not just as bureaucracy, but as a

mechanism for the Kamarupa state to extend its control over a ethnically and culturally diverse landscape. The current literature successfully outlines the broad structure of Kamarupa's administration. However, it reveals significant gaps like there is a need for a more precise understanding of the geographical boundaries of each unit. The functional relationships between different levels of hierarchy require further elaboration. The economic and revenue mechanisms that operated through this system are only indirectly inferred from land grants.

The Kamarupa Kingdom

The name 'Assam' is a relatively recent designation, tracing its origins to the Ahoms. Prior to this, the region was historically known as Kamarupa. This evolution in name reflects the profound geographical and political transformations the region underwent over centuries. Between the 5th to 13th centuries AD, the kingdom of Kamarupa extended as far as the Karatoya River. The Kamarupa kingdom was divided into several levels for easier management, from large provinces down to small areas. *Bhukti* was the largest unit, like a big province. Mandala was a smaller unit, similar to a modern district. Another term for a district-level area was called *Vishaya*. Pura refers to a town or city. There was another type of villages called *Agrahara,* i.e. a village granted to Brahmins from the kings. Some inscriptional evidences of the period mentions that the kingdom was split into two parts, northern part *(Uttarakuladesa)* and a southern part *(dakshinakuladesa)*. This was probably because the Brahmaputra flows through the kingdom dividing the area into two parts. The *Nowgong* Copper Plate Grant of Balavarman III also mentions about the two divisions of the kingdom.

Bhukti

A Bhukti was the largest administrative unit, like a big province. This term, meaning 'enjoyment' or 'domain' is also found in inscriptions as a major division. It was a common administrative unit in contemporary Gupta and Post-Gupta politics, and its adoption by Kamarupa shows this influence. It was so important that it was often ruled by a prince from the royal family. An example from the records shows that the central area of the kingdom pragjyotisha was itself considered a Bhukti. The Kamauli Grant of Vaidyadeva mentions Pragjyotisha a *Bhukti*. B.K. Barua opines that as 'the country was then annexed to Gauda; it was legitimately so named'. The *Bhukti* served as the largest and highest-level provincial unit within the administrative system of the Kamarupa kingdom. Its adoption

demonstrates a clear influence from the contemporary Gupta and Post-Gupta political models. As the most significant territorial division, a *Bhukti,* such as the core region of Pragjyotisha, was typically a domain of great importance, often placed under the direct governance of a royal prince to ensure central control and authority.

Mandala

This was a large territorial unit, often semi-autonomous. The *Kamarupa Mandala* is mentioned, but there were likely smaller mandalas within it. Rulers of these *manadalas* sometimes had the title *Mandalesvara* (Lord of a Mandala). The *Nidhanpur* inscription mentions land grants within the *Kamarupa Mandala*. Another *Mandala Hapyoca* lying to the east of Kirtipura is mentioned in the grant of Vallabhadeva. This place is identified by Kielhorn, editing that record, with *Hapyoma* of the *Gauhati grant*. The Eastern Ganga Copper Plate of Anantavarman (c. 8th century AD) refers to a learned Brahmana (done of the Grant) who hailed from *srngatika Agrahara* in the *Kamarupa-vishaya.* The mandala therefore, appears to have included several *vishayas* or districts. There is no other references to mandala in any inscription of ancient Kamarupa. In this context historian B.N. Puri remarks that 'it is likely that with the changing boundaries of Kamarupa, consequent on the interplay of political forces, the possibility of several other *bhuktis* or mandalas in the administrative set up of ancient Assam is not ruled out.' The limited number of references in inscriptions suggests that the use of Mandala as a formal administrative term may not have been widespread throughout Kamarupa's entire history. As historian B.N. Puri theorizes, the system was likely dynamic. The number and boundaries of these mandalas probably shifted in response to the kingdom's changing political fortunes and territorial expansion or contraction. Therefore, while the Mandala was a key feature of the state's organization, its application was likely flexible and evolved over time.

Vishaya

The next unit was the Vishaya or district; though the exact expanse of territory covered by the term cannot be ascertained from the epigraphs. It is, however, certain that a *Vishaya* consisted of a number of villages or gramas, for a grama is usually described in the inscriptions as situated in a particular *Vishaya*. The Vishaya was furthermore named after its chief town. The following *vishayas* are recorded in the inscriptions, *Candrapuri*, *Dijjinna*, *Kalanga*, *Puranji*, *Trayodasagrama*, *Hapyoma*, *Mandi*, *Bada*. It can be said that the Vishaya functioned as a key district-level

administrative unit within the Kamarupa kingdom. It served as an intermediate jurisdiction that comprised a cluster of villages (gramas), as confirmed by epigraphic evidences. The *Vishaya* was administered by a *Vishayapati.* He had an office at headquarters. The office of the *Vishayapati* included some of the officers like *Nyayakaranika, Vyavaharika, Simapradata, Kayastha, Nayaka, Kosthagarika, Uparika, Utkhitayita, Lekhaka, Sasayitr* and *Sekyakara*. It appears that there was no real separation of civil and military, or executive and judicial functions. Moreover, *Vishayapati* was also at the head of the revenue administration. This is evident from the fact that *Vishayapatis* are invariably included among the officers who are directed not to interfere with the peaceful enjoyment of rents, free lands and villages granted by the crown. A distinctive feature of the Vishaya was its common practice of being named after its chief town. The inscriptions provide concrete evidence for this structure, recording several specific Vishayas, which substantiates its role as a fundamental building block of the kingdom's territorial administration.

Pura or Towns

The Kamarupa kingdom featured important, well-planned cities such as Pragjyotishapura, Durjaya and Kamrupanagara. These urban centres were fortified, with organized roads and streets, bustling with shops and traffic. A diverse population of scholars, teachers, poets, artists, and merchants contributed to their vibrant, cosmopolitan atmosphere. Kings provided patronage to poets and learned men at their courts. The royal court also included royal priest, who advised the king on both spiritual and administrative matters, as well as court Physicians. Unlike the villages, there is no evidence of a local city council. This suggest that city administration was handled centrally by the king's government, not by a local body. Cities were the seats of the *adhikarana* (government), *skandhavara* (royal camp), or of *durga* (fort). Religious as well as commercial considerations too, were responsible for the creation of new cities or for the growth of a village into a town. The towns were adorned with many temples. The temple was the centre of many attractions and amusements. It served many more purposes than that of worship. The references of these towns in the inscriptions offers a valuable glimpse into the political structure, social life, and economic dynamics of early urban centers in the Brahmaputra Valley. The concentration of diverse professions, royal patronage, and intellectual activity made these cities the engines of cultural and economic progress for the entire

kingdom. The creation of military camps and forts would naturally evolve into populated settlements, serving strategic purposes.

Grama

This section outlines the foundational role of the village in the Kamarupa kingdom, highlighting a multi-layered administrative and social structure. Village (Grama) was the fundamental unit of administration, revenue and society. There are references to a number of villages such as *Abhisuaravataka, Hensiva, Trayodasa, Haposa, Bhavisa, Kanjina, Guhesvara, Digdola, Chadi* etc. in the inscriptions of early Kamarupa. B.N. Puri mentions that some of these names are Sanskritized ones while others are tribal names. There are also references to *agraharas* which were probably made up of many village settlements. A *agrahara* was a special type of settlement, central to the socio-economic and religious policies of the kingdom. The main purpose of this was a grant of one or more villages to a community of Brahmanas. This was done to reward learning, promote Vedic rituals, and spread Sanskritic culture within the kingdom. These were not just religious centres, but the landowners, the *Brahmanas* were responsible for developing the land, settling peasants, and agriculture. They acted as centres of learning and helped integrate new areas into the cultural and political fold of the state. The copperplate grants record specific *Agraharas* like *Mayurasalamalagrahara* and *Srigatikagrahara*.

The *Pataka* was a recognized administrative unit, but is exact size is interpreted differently. Some scholars believe it referred to a specific ward or section within a larger village. The term was also used in the Pratihara Empire (in Northern India), but the *Kamarupa Pataka* was distinct and not connected to the one near Varanasi. Inscriptions mention places like *Kasi-pataka* and *Vamadeva-pataka*. Sometimes a couple of terms such as Konch and Palli are also found recorded. These terms represent the smallest units of habitation, often reflecting indigenous, pre-existing settlement patterns. Koncha was likely a very small village or a hamlet. It might have been inhabited by a specific class, caste, or tribal community, indicating a settlement based on kinship or occupation. Palli literally means a 'row' or a 'cluster of houses'. It signified a hamlet i.e. a small settlement that was often a subsidiary of a larger village. The village and place names of the province generally owe their origin from castes or tribe, geographical and physical features such as lakes, rivers, hills, tree, religious character, flora and fauna of the country.

Thus, the structure flowed from the large Bhukti, Mandala, Vishaya (district) down to the village (Grama), and further into sub-village units like Pataka, Koncha, and Palli. This granular division allowed the state to effectively manage land, collect taxes, and maintain order at the most local level, reaching even small, specialized communities. In essence, these subdivisions were the capillaries of the Kamarupa state, ensuring that the king's authority and the kingdom's administrative machinery extended into every corner of its territory.

Conclusion

This was a hybrid and hierarchical administrative model. The administration was not a haphazard arrangement but a sophisticated, multi-tiered hierarchy. The system seamlessly blended the pan-Indian Sanskritic nomenclature with indigenous local terms, demonstrating a pragmatic approach to governance that accommodated both supra-regional models and local realities. The administrative geography was not static. The evidence indicates that the size, number, and designation of units shifted in response to the kingdom's changing political fortunes and territorial expansion or contraction. This fluidity reveals a state apparatus capable of adapting to new geopolitical realities. The Agrahara system was far more than a religious act, it was a core administrative strategy. These land grants to Brahmins served as a primary tool for agrarian expansion, cultural integration of tribal areas, and the creation of a loyal, revenue-generating gentry that extended the state's influence into the hinterlands.

The administration geography of Early Kamarupa, as reconstructed from its inscriptions and literature, presents a picture of a mature and strategically adept early medieval state. Its hierarchical structure-flowing from the provincial Bhukti down through the semi-autonomous Mandala, the operational Vishaya, and into the foundational Grama and its hamlets-was not merely an organizational chart, it was the very mechanism through which the kingdom achieved political integration, economic vitality, and cultural hegemony. This study conclusively demonstrates that the Kamarupa state was a significant polity in early India, one that did not merely imitate the Gupta administration model but intelligently adapted it to its unique geographical and socio-cultural landscape. The strategic use of land grants, the flexible application of territorial terms, and the blend of Sanskritic and indigenous elements reveal a sophisticated statecraft designed to unify a diverse and expanding territory. Ultimately, the enduring legacy

of Kamarupa's administrative system lies in its demonstration of how a regional power could forge a cohesive and enduring state structure, a foundation upon which subsequent kingdoms in the Brahmaputra Valley would build.

References

K.L. Barua, Early History of Kamarupa, Bhabani Edition, March 2014, p. 1

B.K. Barua, A Cultural History of Assam, Bina Library, 1951, 1986, Third edition, p.13

Ibid., p.13

B.N. Puri, *Polity and Administration* in H.K. Barpujari (Ed.), The Comprehensive History of Assam, Volume I, Publication Board Assam, 1990, p.182

B.K. Barua, op. cit., pp. 58-59

Nayanjot Lahiri, Pre-Ahom Assam, Munshiram Manoharlal Publishers Pvt. Ltd, 1991.

Ibid., P. 14

M.M. Sharma, Inscriptions of Ancient Assam, Gauhati University 1978, p.146 (v. 33)

Ibid, Kamauli Copper-Plate Grant of Vaidyadeva, v.48, p.280

Barua, op. cit., p. 58

B.N. Puri, op. cit., p.182

Ibid.,

Barua, op. cit.,

Puri, op. cit.., p.182

M.M. Sharma, op. cit., Nidhanpur Copper plate inscriptions, Verse.49, p. 43

Ibid., The Nowgong Copper Plate Grant of Balavarman, v. 33, p.143

Sharma, ibid, Sualkunchi Copper Plate Grant of Ratnapala, p.174

Sharma, ibid., Pushbhadra Copper Plate Grant of Dharmapala, p.261

Sharma, ibid., Bargaon Grant Copper Plate Grant of Ratnapala, p. 153

Ibid., Gauhati Copper Plate Grant of Indrapala, p.183

Ibid., Guwakuchi Copper Grant of Indrapala, p.193

Ibid., Kamauli Grant of Vaidyadeva, v.49, p. 280

B.K, Barua, op. cit., p.59

Ibid.,

Puri., op. cit., p183

Barua, op. cit., p.79

Ibid., p.83

Puri, op. cit., p182

Ibid.,

Ibid., p.183

Ibid., p.183

Ibid., p183

Barua, op. cit., pp.75-76

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Reflection of Ethnic Assertion in the Northeast and its Role in Shaping Democratic Discourse of India

Udipta Saikia[1*] and Gitanjali Borthakur[1]

Accepted : 11 July, 2026

Abstract

Ethnicity can be termed the quality of belonging to a group that shares a common consciousness of shared origins and traditions. The northeastern part of India, apart from being a naturally rich region, is home to multiple ethnic identities. All the states of northeast India consist of a great number of ethnic groups. A region characterized by great ethnic diversities and complexity of culture, the democratic setting in northeast India is strongly influenced by ethnic identities. As democracy is a multidimensional concept, its functioning is determined by several important factors. In the case of northeast India, ethnicity plays a very important role in determining the functioning of democracy. The study attempts to analyze the nexus between ethnic identification and democratic functioning in this context. It stresses how ethnicity affects political representation, focusing on the asymmetrical federal

*Correspondence :
Email: saikiaudipta9@gmail.com

[1]Department of Political Science
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

provisions of the Indian Constitution along with emphasizing provisions guaranteeing the rights of cultural and linguistic minorities. The role of cultural identities in determining the electoral agendas of political parties and voting behavior is also examined. Apart from this, the presence of multiple different and sometimes culturally opposing ethnic groups impacts the working of democracy. In Northeast India, one of the driving forces of the insurgency movements has also been ethnic identity. These insurgent groups impact the functioning of democracy in the region. The growing immigration rate in this region from the neighboring countries and its interplay with the indigenous ethnic identities influence democracy. The study aims at covering all these aspects in understanding the interaction between democracy and ethnicity. The study also seeks to analyse how the federal context of the nation has tried to address the issues in a democratic framework alongside the study chiefly focuses on the success rate of the state in its dealings with the issues of the region.

Keywords Ethnicity; Asymmetrical federalism; Democracy; Representation

Introduction

As a patchwork of various ethnic groups, languages, and cultures, Northeast India has long been the centre for dispute over identity and ethnic assertion. There are many different indigenous populations living in this dynamic eight-state region, each with their own unique history, customs, and goals. The complex socio-political setting of Northeast India has greatly influenced the process of ethnic assertion which is frequently characterized by calls for increased autonomy, the recognition of indigenous rights, and, in certain situations, secessionist movements. In addition to reflecting cultural pride, the ethnic assertions in the Northeast are also motivated by historical grievances, economic marginalization, and the desire for political self-determination. The democratic discourse has been significantly shaped by these movements. These movements have played a significant role in shaping the democratic discourse in India by challenging the nation-state to accommodate and respect the plurality of identities within its borders. The Indian Constitution, with its provisions for autonomy and special rights for the tribal communities of the Northeast, represents a recognition of this diversity. However, the ongoing ethnic assertions continue to influence the evolution of democratic practices and policies, pushing for a more inclusive and representative democracy that addresses

the unique needs and aspirations of the region and its people. The study focuses the vibrant and dynamic measures the state has taken in order to deal with the Northeastern States and their respective issues. This study primarily analyses the shortcomings of the accommodative policy the nation state has so far adopted in this context.

Objectives

The study attempts to fulfil the following objectives -

1. Understand the historical background of ethnic assertions in northeast India.
2. Analyze the nature and characteristics of the expressions of ethnic assertion in northeast India.
3. Analyze the impact of ethnic assertions on the democratic functioning of the nation.
4. Analyze the Constitutional and political responses of the Union government towards the assertions.

Review of Literature

Sanjib Baruah (2001) argues that tracing the historical roots brings to light the very fact that, only after signing the Treaty of Yandaboo (1826), Northeast came out of its prolonged phase of isolation and was integrated within the rest of India as its province. Soon after its integration with colonial rule, the land fell prey to the 'Divide and Rule' policy of the Britishers on the basis of physiographic division that developed feelings of alienation among the tribes that had lived peacefully there, since time immemorial. Alaka Sharma (1999) further stated how the Britishers introduced the Immigration Policy, which welcomed thousands of outsiders to the land and in the long run, posed a challenge and threat to the indigenous culture of the people. Huge influx into the region is a serious problem of Northeast in contemporary times too which poses a challenge to the identity of indigenous tribes of the land. This led to the rise of 'feeling of alienation and separation' in the Northeast, which is further ignited by forces like 'forceful homogenization' by the newly independent state in its attempt to form a homogeneous national identity. The homogenization of Indian national identity after independence marked the beginning of identity politics. The working of the Indian state reveal how the elements of Hindu identity, the most powerful and pervasive, received the widest favour and support from the government's nodal agencies and institutions in the name of promotion of Indian cultural identity,

whereas other cultural identities were either marginalized or pushed towards the periphery of mainstream politics. (M Sangha, 2016).

The smaller groups face the situation of an identity crisis on the eve of forced assimilation in the name of accommodation and integration. It reflects how fear of assimilation and marginalization in their homeland paved the way for 'Violence' and 'Arms' and 'Political Unrest'. Hiren Gohain, Monirul Hussain and Tarun Gogoi argues that it's the policy of mainstream dominance of Assamese nationalism which initiated policies like othering the 'Bodos' in Assam- who took part in the Assam movement, demands of the All-Assam Students' Union about the abolition of the constitutional safeguards provided to the tribals, the way of bracketing the tribals of even the Brahmaputra valley in the non-Asamiya category during the Assam movement ,the way in which the post-colonial Assamese ruling class was not concerned with the problems faced by the plains tribes viz. the Bodos, Misings, Sonowal-Kacharis, Deuris, Rabhas, Tiwas like problem of land alienation, poverty, indebtedness, unemployment and political oppression etc. inculcate a sense of remoteness and deprivation in the minds of the plain and hill tribes. Therefore, in post-colonial Assam, they are now trying to revive their own identity and demand for political autonomy because of their oppressed status and hatred against the caste Hindu dominated Assamese ruling class. This feeling manifests in the movements for distinct identity launched by the ethnic groups under the leadership of their respective emerging educated elites and sometimes even take violent turns (Tarun Gogoi, 2022). It vehemently affects the functioning of the state and in a way, develops a different yet accommodating political approach that shapes the 'democratic discourse' of the nation. It is evident that, in the later decade of the twentieth century, Undivided Assam witnessed a voice of protest from Plains Tribal Council of Assam (PTCA of1967), that for the very first time raised the demands for a separate plain / tribal land named as 'Udayachal'. In the following period, Northeastern States were reorganized but to utter dismay, problems of ethnic assertion and demands of autonomy of both hill and plain tribes of Assam continued to be the burning issue of the land. Assam witnessed a series of political upheaval with a number of ethnic groups asserting their respective demands either for separation or greater autonomy. Slogans like "We are Bodos, not Assamese", (Sanjib Baruah, India

Against itself, 2001) narrates how in about late eighties, the Bodos became assertive of their respective rights and demanded deportation of migrants in their land The Bodo movement became more assertive with the formation of the National Democratic Front of Bodoland (NDFB). One of its wing NDFB(S) headed by Shorobjit is active till date. Similar statehood demands dot Assam, 'No State No Rest' was the most popular bills wrote in most of the walls in Diphu town, situated at the heart of the Karbi Anglong, a district of Assam in the mid-1980, it refers to the demands within the hill districts of Karbi Anglong for a Karbi State for the Karbi ethnic group and the hill district of North Cachar Hills demanding a Dimasa state for the Dimasa ethnic group. (Geetimala Talukdar, 2020)

The asymmetrical federal contents of the Constitution of India enable some states, especially the northeastern states, to strengthen their participation in the governance and administrative processes. Rekha Saxena's work 'Is India a Case of Asymmetrical Federalism?' provides an understanding of these provisions and how the Indian experience shows that asymmetries do not always lead to secessionism (Saxena, 2012).

Arushi Gupta's (Gupta, 2015) work 'Central Assistance to North Eastern States: A Comparative Analysis' gives an understanding of the initiatives taken by the Union government, taking into consideration the distinct economic needs of the northeastern region. It deals with the special category status given to the northeastern states and, in detail, discusses the financial grants and the overall workings of the Finance Commission towards the northeastern states. Scholars argue that the state of political unrest in the northeastern region has drawn attention far and wide. The policies adopted by the state apparatus however have failed miserably in addressing the issues. The Geographic discontinuity often is blamed as cause of both underdevelopment and secession induced tendencies of the land.

However, if one delves into the intricacies, one can surely find the gross lack of political will on the part of state and its lackadaisical attitude while dealing with the issues.In many cases, state actions lead to gross violation of rights in Assam and its neighbouring states and it becomes counterproductive and even multiplies the problem.The grim state of affairs and lack of basic human rights are apparent from the fact that US Department of State enumerated 40 custodial deaths between 1991 and early 1992.It bear the testimony of

glaring violation of human rights by the Indian state through its security forces. Not only this, the state is lacking behind in other aspects like education, food security, ecological destruction, unemployment and people are not free from 'freedom of want' and 'freedom of fear' that constitute the bedrock of human security. Prof Akhil Ranjan Dutta and Tarun Gogoi argues that even after more than sixty years of independence, it appears to the people of northeast that Indian state treats the entire region primarily as a supplier of raw materials and a market for goods produced in the rest of the country. The region continues to remain a 'periphery' of the country in all alleged sense.

Rationale of the Study

The study will look into the intricacies of ethnic unrest in Northeast along with delving into its historic origin and factors that contributes to perpetual existence of political unrest in the region. It also seeks to examine the responses made by the state apparatus while dealing with issues of identity politics, ethnic unrest and insurgency in the region that often faces intense criticism from political scientists and commoners alike due to negligence on part of state actors in protecting and promoting indigenous rights of commoners, the issues with the development trajectory undervaluing the notion of human development and security in the multilingual and multi ethnic region. The study will also enable us to better understand the fundamentals and traits of regional politics of the states and how the unresolved issues often are used for political gains and electoral victory. The study thus will help to examine the desired role and countervailing strategy of state to deal with ecological, political, economic and social issues of the land, that will unlock for the region and its people, a roadway to security, empowerment, development and durable peace.

Methodology

The present work has relied on both qualitative and quantitative data. In the process of data collection, the study has relied on secondary sources. The study is based on comprehensive collection of studies that encompasses wide range of research that includes the official reports of the government departments, newspaper articles and others. To conduct scholarly research, we took up keywords such as ethnicity, secessionism, federalism, democracy in the respective keywords were utilized to search databases like web of science, google scholar and Scopus. The study is based on Secondary sources like books,

research articles which are beyond online resources to provide insights at macro and micro level analysis. The collected data has been systematically revised and refined and the redundant data has been eliminated. Systematically the gathered authentic information has been analyzed and compiled. This rigorous methodology has been taken to ensure the study is comprehensive and relevant so as to provide valuable insight on the concerned topic. The study also makes use of historical approach as it has to look into the historical evolution of ethnic assertion among the people of Northeast India.

Findings

Northeast: A Glimpse of the Issues Involved

The Northeast Region is considered to be the most diverse region of the world. Scholars such as Anindita Dasgupta terms it as "miniature Asia" owing to its demographic diversity. Its diversity, however, quite a times, has led to conditions of political and social unrest in the region. Tracing down to the historic period, the Britishers introduced the policy of immigration, the Inner Line Permit followed by some other provisions like the Simon Commission, Government of India Act. Along with it, Northeast in the post-independence period, witnessed a host of issues like continuous neglect of the region by the centre, illegal immigration, threats posed by modernity and the repercussions of neoliberal state, regional backwardness and uneven development which further mushroomed the feelings of alienation and consequently the region is home to ethnic politics that quite often develop and manifest itself as insurgencies and movements for secession. Despite its geo strategic location and vast reserve of resources, the land however has turned to be a 'Cauldron of Conflict' and has been lacking behind in all perspectives in terms of development and is also infamous for wide scale violations of human rights in the region to cite a few, instances are there that the US Department of State enumerated 40 custodial deaths between 1991 and early 1992 in Assam (Sarmah,2008). The region, considered as the gateway of 'South-East Asia' for India demands for effective and responsive action on the part of the state, for the multidimensional conflicts to be addressed and solved at earliest .

Ethnic Assertion and the Northeast: The Trajectory So Far

No wonder the land has witnessed some of gruesome and deadliest flights for autonomy by different groups in

the region. Every ethnic group has its own respective ethnic-based social organisation; for instance, Khasi, Garo, Boro, Naga, Mizo, Kuki, Meitei, Karbi, Hmar, Dimasa, Assamese, etc. Not only the ethnic-based social organisations, but also most of the ethnic groups in the state have insurgent group. (Shimray, 2004). Demands for autonomy in the region however, was for the very first time put forwarded by the Nagas just before the day of India's independence. The Nagas consider themselves to be different group with their own historic identity, which according to them is under threat due to imposition of forceful assimilation by the Indian State. Insurgency is thus a common and widespread phenomenon in the land and a faction of Naga insurgents keep demanding 'Nagalim' as a separate state and greater Nagaland as their homeland.

Meghalaya in late seventies witnessed widespread protests for the removal of non-tribals from Meghalaya. The Khasi students Union led anti-foreigners movement that aimed at total ethnic cleansing in the land where the non-tribal foreigners, Bengalis, Biharis, Marwaris and others faced violence and life threatening attacks. Effects of this grievances are still seen in the land.

Manipur and Mizoram too witnessed ethnic assertions and political unrest. In Manipur, in 1964, the United National Liberation Front was created, which promoted insurgency. Demands for greater autonomy are still a burning issue of Manipur.

Assam and its people witnessed rise of insurgent groups and the development of sub nationalism within the state as a perpetual phenomenon. The whole of the region is vulnerable to illegal immigration from neighboring countries, which is a nightmare for the land and its people. Immigration is such an issue here that Assam in 1979 witnessed an anti-immigration movement that aimed at identification and deportation of illegal immigrants. Assam also witnessed in late seventies the rise of an insurgent group, the United Liberation Front of Assam that took a pledge to make Assam an independent nation in the form of Swadhin Axom to remove Assam from the status of a hinterland. It is still active in Assam. The state had a dark period in late eighties. It witnessed rise of subnationalist tendencies in the state when the Bodos after the Assam Movement stated "We are Bodos, not Assamese", they asserted (Baruah, India Against Itself, 1999) and demanded for a separate homeland for the Bodo people. Similar demands for autonomy were also raised in hilly terrain of Karbi Anglong and North Cachar.

Likewise, instances are there about the rise of Adivasi Militancy in Assam.

The All Assam Adivasi Students' Association along with Assam Tea Tribal Students' Association have been agitating for years demanding recognition of tea tribals and adivasis as scheduled tribes. And now there is an armed group calling itself the Adivasi Cobra Force. (Gohain,2007). Apart from it, the innumerable tribes (plains and hills) has been demanding greater representation and Autonomy for identifying and representing themselves in power structure. At the same time, voices have been raised by different communities, including Amri Karbi, Garos of Assam, Gorkha, Non-Dimasa (Kuki, Hmar, Biate, Hrangkhol, etc) communities in North Cachar Hills and recently the scheduled caste communities in Assam in favour of their demand for more autonomous councils for them within the state. (Jayanta Krishna Sarmah,2011). It reflects the trends of assertion of identity among the innumerable tribes of Northeast that want greater autonomy for themselves to preserve and protect their native identity.

Issues of Identity Politics of Northeast : A Review of Response From the State

The historic conditions, issues of unequal development and geographical isolation from mainland have proved to be the prime causes for the state of political unrest of the Northeastern region. Political unrest and violence followed by rise of insurgency in the region can be witnessed throughout the region and it continues to be 'Colonial Hinterland'. Not only the states, barring few, are home to political unrest, the air of violence continues to endanger the peace and human security of the populace there, but the states are also lacking behind in aspects like education, food security, political representation and employment. It collectively reflects that people of the region are neither free from 'freedom of want' nor from 'freedom of fear'. This brings the necessity to review the responses made by the state apparatus to resolve the conflicts of the region and what measures has been taken so far to address the issues of the natives of the land. Referring to the measures adopted by the state, it ranges from Constitutional Provisions to Peace accords followed by special provisions given to the states.

Asymmetrical Federalism

Due to the multicultural character of Indian society, the Indian Constitution attempts to accommodate the diversity through asymmetrical provisions. These provisions are unique arrangements

created to take into account the unique requirements and conditions of various areas or groups within a nation. In Northeast India, these provisions play a vital role as they protect and promote the unique identities of the ethnic groups living in the region.

The asymmetrical provisions guarantee the participation of these people in the process of governance and thus ensure democracy. Apart from the cultural dimension, the socio-economic and geographic characteristics of the region also call for special provisions for this region. To protect the distinct identities of these diverse groups, the Constitution of India, under Part XXI, includes provisions for special powers for some of the states (Barua & Rouleau, 2011). Among these, Articles 371A, 371B, 371C and 371G are worth mentioning in this regard, which deal with the Northeastern states. Article 371 A and G provide that a parliamentary statute to be extended to the states of Nagaland and Mizoram requires the consent of the legislatures of those states, if the law concerned relates to the religious and social practices of Nagas and Mizos, their customary law and procedures, the administration of civil and criminal justice affecting these customary laws, and the ownership and transfer of land resources of these states. (Saxena, 2012). Similarly, Articles 371B and C provide for the creation of a committee of the legislative assemblies consisting of members from the tribal and hill areas of Assam and Manipur, respectively. All these provisions promote the political voice of the marginalized communities by ensuring their participation and protecting their distinct interests, thus enhancing democracy.

In addition to this, the Constitution under the Sixth Schedule contains provisions relating to the administration of triibal areas in the states of Assam, Meghalaya, Tripura and Mizoram. It allows for the creation of Autonomous District Councils and Regional Councils. The membership in these councils should consist of tribal population, and they were given significant legislative, administrative, judicial and financial powers. The Sixth Schedule guarantees and protects the rights of the tribal population. The councils are vested with large powers over their areas and the Governor was given the power to play a supervisory role over their functioning (Barua & Rouleau, 2011).

Other Provisions of the Indian Constitution

Although the people of Northeast India are entitled to enjoy all the fundamental rights enshrined

in the Constitution, the fundamental rights under Articles 29 and 30 deserve special mention. Through Article 29(1), the ethnic groups are entitled to the protection of their distinct language, culture and script, while Articlecle 30 enables the religious as well as linguistic minorities to establish and administer their educational institutions. In addition to that, the affirmative action policies of the state also protect and promote the participation of ethnic communities, thereby ensuring democracy. Besides the asymmetrical provisions, some other provisions of the constitution also safeguard the democratic functioning in these regions. Article 46 deals with the promotion of educational and economic interests of the Scheduled Tribes along with other weaker sections of the society, while Articles 330 and 332 ensure the participation of people belonging to the Scheduled Tribes in the House of People and the State Legislative Assemblies. Article 244A provides for the formation of an autonomous state comprising certain tribal areas in Assam and creation of local Legislature or Council of Ministers or both. Given the unique ethnic and cultural diversity of these states, these provisions aim to safeguard their cultural identity, sovereignty, and governance.

Special States Status

Along with political participation, the inclusiveness of democracy can extend to the social and economic spheres as well. The Central government provides special assistance to certain states that face geographical and socio-economic disadvantages. The National Development Council grants special category status to the states on the recommendation of the erstwhile Planning Commission (Gupta, 2015). Northeast India's eight states are all granted Special Category Status. The Special Category of States was established in 1969 by the Fifth Finance Commission with the intention of giving them tax benefits and federal aid. The following qualities are necessary for a state to be classified as a Special Category State: 1) rough and hilly terrain; 2) sparsely populated areas or a significant tribal population; 3) strategically located near borders with neighboring countries; and 4) non-viable financial situation. The following Northeastern Indian states were designated as Special Category States: Mizoram and Arunachal Pradesh in 1972; Sikkim in 1975; Assam and Nagaland in 1969; Meghalaya, Manipur and Tripura in 1972; Sikkim in 1975; and Mizoram and Arunachal Pradesh in 1987.

Peace Accords and Negotiations

In northeast India, insurgency has had a major impact on the democratic

functioning of the region. This region has been witnessing various insurgent movements driven by ethnic, political and economic grievances. The Union government, over the years, has engaged in a number of talks that have resulted in a number of peace agreements and settlements meant to put an end to violence and accommodate the insurgent organizations into the political system. Through various peace accords and initiatives like the Mizo Peace Accord, Assam Accord, Shillong Accord, Bodo Accords, Framework Agreement with NSCN-IM, and the recent talks with ULFA, the Union government has been trying to accommodate the insurgent groups of northeast India. Though the outcome of peace negotiations and settlements in Northeast India has varied, overall, they have helped reduce conflict and incorporate rebel groups in the democratic process.

Ethnicity in Shaping Democratic Discourse

Northeast India's diverse ethnic landscape has an important effect on the democratic discourse in India, influencing governance, policies, and the wider view of federalism and ethnic diversity across the nation. The demands for autonomy and self-governance by the various ethnic groups resulted in the creation of autonomous councils, districts which has led to the inclusive participation of the people of that region in the system of governance and administration. Ethnic identity based political parties have also had a significant impact on state and federal politics, affecting laws pertaining to local government, property rights, and cultural preservation. They represent the interests of these ethnic communities. Apart from that, the reservation policies have strengthened the participation of these marginalized groups in democratic processes at both regional and national levels. Although the governmental responses have had a positive impact in preserving democracy, ethnicity continues to raise issues with national integration, political fragmentation, governance, and conflict. The insurgent movements based on ethnic identities have the potential to endure and generate conflict, which can undermine democratic governance by disrupting administration, causing instability, and taking funds away from development. Apart from that, increased militarization is frequently used as a response to insurgencies, which can lead to violations of human rights. This hampers democratic participation and erodes confidence in democratic institutions. Given the continuing challenges to development, stability, and governance in Northeast India, the Indian government must speed forward

its efforts to resolve ethnic conflicts in that region.

Conclusion

The incredibly diverse region of northeast India is home to numerous ethnic and linguistic groups, diverse religious groupings, and fascinating customs. Throughout history, the Indian state has encountered difficulties in addressing ethnic claims in northeastern India. The government has attempted to address the region's diverse ethnic interests through a number of initiatives, including the creation of new states, the division of existing ones into new ones, such as Nagaland, Meghalaya, and Arunachal Pradesh, peace accords and talks, holding talks with rebel groups and signing peace agreements, such as the Naga Peace Accord, and granting autonomy to some areas, like the Darjeeling Hills and Bodoland. To solve the intricate problems in the area, additional work must be done in spite of these endeavors. It has so far been observed that despite the untiring efforts of the government in dealing with the issues, Northeast continues to be a hotbed of ethnic conflict, a terror stricken disturbed region infamously known as 'Cauldron of Conflict'. The government needs to continue addressing development inequalities, fostering inclusive governance, and interacting with ethnic communities in order to bring stable and lasting peace, multidimensional development and human security in the region. In addition to this, initiatives for economic growth, cultural and heritage preservation, and inclusiveness and representation of diverse communities and their demands should be undertaken so as to develop Northeast as hub tourism, development and peace. The government can seek to establish long-term solutions that respect the rights and aspirations of all ethnic groups by recognizing the richness and complexity of Northeast India. This calls for a persistent dedication to continued interaction and collaboration.

References

Acharya, A. (2008). Affirmative Action. In Acharya A. & Bhargava R.(ed.), Political Theory: An Introduction (pp. 298-307). New Delhi: Dorling Kindersley (India) Pvt. Ltd.

Baruah, S. (2001). India Against Itself: Assam and Politics of Nationality. New Delhi: Oxford University Press.

Baruah, P., & Rouleau, N. M. (2011). Democracy, Representation, and Self-Rule in the Indian Constitution. Verfassung Und Recht in Übersee / Law and Politics in Africa, Asia and Latin America, 44(2), 177–195. http://www.jstor.

org/stable/43239606

Das, N. K. (2009). Identity Politics and Social Exclusion In India's Northeast: A Critique Of Nation-Building And Redistributive Justice (pp. 549-558).

Datta, P. (1992). Secessionist Movements in Northeast India. The Indian Journal of Political Science, 53(4), 536-558.

Gogoi, D. (2016) Unheeded Hinterland: Identity and Sovereignty in Northeast India, New York: Routledge.

Gupta, A. (2015). Central Assistance to North Eastern States: A Comparative Analysis. Retrieved from https://mora.ub.uni-muenchen.de/68904

Hussain, Monirul. Tribal Question in Assam, Economic and Political Weekly , May 16-23, 1992, Vol. 27, No. 20/21 (May 16-23, 1992), pp. 1047-105.

Patgiri, R., & Gogoi, D. (2022). Act East Through India's Northeast: Limits Of Neoliberal Strategies Towards Developing An Underdeveloped Region. South Asian Survey.

Rajagopalan, S. (2008). Mapping Peace Accords. In Peace Accords in Northeast India: Journey over Milestones (pp. 12–29). East-West Center. http://www.jstor.org/stable/resrep06521.8

Saxena, R. (2012). Is India a Case of Asymmetrical Federalism? Economic and Political Weekly, 47(2), 70–75. http://www.jstor.org/stable/23065612

Sarmah, J. K. An Alternative Formulation for Autonomous Councils in Assam. Economic & Political Weekly. Vol xlvi, August 27, 2011.

Sarmah, Jayanta Krishna, Nirmala Devi and Amar Deep Pegu (2008). Ulfa Versus State – Unresolved Issue of Sovereignty: A Human Rights Perspective. The Indian Journal of Political Science. Vol. 69, No. 4 (OCT. - DEC.), pp. 825-831.

Sharma, A. (1999). Immigration and Assam Politics, New Delhi: Ajanta.

Shimray, U. A. (2004). Socio-Political Unrest In The Region Called North-East India. Economic And Political Weekly, 39(42), 4637-4643.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Swa Nirbhar Naari Scheme and Handloom Industry: A Study on the Weavers of Nagaon District of Assam

Gitashmayee Sharma[1], Sangita Borah[2] and Gitika Borah[2*]

Accepted : 12 July, 2026

Abstract

There is no doubt that the door towards a self- reliant India will be opened by the use of "local products", made by local people. Like other parts of India, Assam carries its own traditional art and crafts, which have its own market base. These handicrafts provide livelihood to lakhs of people in rural and semi rural areas of Assam. Undoubtedly, it (Handloom and Textile works) can be a means towards achieving the goal of a self reliant India. As there was a high loss of the country's economic and overall spheres due to Covid-19, an economic package of INR 20 Lakh Crore was announced by Hon'ble PM Modi, aiming towards an self-reliant India (Atmanirbhar Bharat Abhiyan). It has an aim to enter into the global markets with

*Correspondence :
Email: borahgitika27@gmail.com

[1]Department of Political Science
Cotton University, Guwahati, Assam-781001

[2]Department of Political Science
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

the country's own hand made products and to develop India into a global supply chain hub. However, the extent to which the policies under the mission have been implemented on the grass-root level should be noted. The study underscores the impact of Atmanirbhar Bharat Abhiyan on the socio economic status of weavers of Nagaon district, Assam with special reference to Swa Nirbhar Naari scheme (2022).

Keywords Assamese weavers; Handloom industry; Local handloom products; Atmanirbhar Bharat Abiyan; Self-reliant; Swa Nirbhar Naari Scheme

Introduction

Assam, with her unique geographical location, distinct ethnic culture and peculiar socio-economic characteristics occupies an important place among the states in India. As per 2011 census data, Assam covers a geographical area of 78,438 sq.km. of which 98.4 percent area is rural area and has a population of 312.05 lakh, out of which 86% population lives in rural area and just 14% population in urban areas (Directorate of Economics and Statistics, Govt. of Assam:2024). As a very large amount of population lives in rural area, most of the people in Assam are engaged in agricultural activities rather than industrial work; handloom weaving than power-loom weaving; traditional handicrafts rather than machine produced crafts and fabrics. Traditional crafts or Handloom weaving is almost common to all rural households in Assam. That is the reason why, handloom weaving becomes a way of life for the most of the people in Assam. Among the different handicrafts, Handloom weaving industries play a key role in the social and economic life of Assam (Handique:2016). Weaving is a process of fabric or cloth production, where yarns are interlaced to each other to form a cloth or fabrics; while Handloom is a simple manual operating system used for weaving (Textile Committee, Govt. of India). It takes more time to produce cloths compared to high speed of power looms. But, the quality of cloths and fabrics produced by handloom is obviously more satisfying and better in texture than machine-based power loom products. Some natural fibers such as cotton, jute and silk are mainly used for handloom (Jain, 2007). Primarily, there are two types of handlooms:1) Frame loom and 2) Pit loom. However, in Assam, Pit looms are mostly used for weaving. Some of the main products made by them are pat silk, Muga silk, fulam Gamosa, mekhela sador, eri fabrics etc.

But, the call for self-reliant is

not a new concept for the country. There were instances when the slogan of Swabalambi Hao Ahok (Let us be self-reliant) was popular among the student community during the period of the Assam Movement. This is also in consonance with Mahatma Gandhi's vision of a Self – Reliant India, mainly focusing on Handloom and Textile works (The Sentinel: 2020). By observing this unique talents of Assamese weavers, Mahatma Gandhi once said, "Assamese women are born weavers, they can weave fairy tales in their cloth". There is no doubt that from the last two decades India has been focusing mainly on the country's economic independence, the handloom sector being a crucial part of it. But, from the outbreak of COVID-19 Pandemic in the year 2019, India has been facing consequent challenges on its way to become a self-reliant country. The estimates prepared by the National Statistical Office, Govt. of India, on 31st August, 2020 proved that the India's Gross Domestic Product (GDP) in the first quarter of 2020-21 was estimated at Rs.26.90 lakh crore implying as compared to 5.2 per cent growth in the first quarter of 2019-20 (i.e. before COVID) (Sur, Prasad:2020). Because of this situation, after the Pandemic, government of India have been taking so many initiatives for the revival of previous growing position of India in the world economy. Among the other sectors of India's economy, the government also point their eyes towards the Handloom and Textile sector as one of the medium of India's way to a self-reliant country. By considering the uniqueness of this Handloom sector which has an extent to the grassroot level with engangement of local indigenous people from the very ancient times. The present study will concentrate on the model of Atmanirbhar Bharat Abhiyan and its relevance in some weaver concentrated areas of Assam's Nagaon district especially focusing on Swa Nirbhar Naari Scheme.

The study aims at analysing the impact of Atmanirbhar Bharat Abhiyan on the socio-economic status of weavers with special focus on Swa Nirbhar Naari scheme. An attempt has been made to identify the problems faced by Assamese weavers for working in Handloom Industries. The study tries to compare the status of weavers before and after the implementation of Swa Nirbhar Naari scheme. The role of local Handloom industries in the growth of country's economy has also been highlighted in the study.

Study Area

In order to achieve the aforesaid objectives, Nagaon district of Assam has been chosen for the study. A large

number of rural people are involved in handloom and textile works from years in Pakhimaria, Raha, Kathiatoli, Batadrawa, Barhampur,khagarijan and Kaliabor blocks of Nagaon district. The study will mainly focus on Raha block, which has a Handloom Training Centre and Nagaon town with two private handloom industry in Chandanpur and Amulapatty. Raha block and Private Handloom industries in Nagaon town area has been selected as sample area, where a large number of weavers are engaged from many years. That means they have been engaged even before the implementation of SNNS, and continuously engaging also after implementation of the scheme. For the collection of data 32 weavers has been interviewed from these sample areas.

Data and Methodology

The method used in this study is qualitative in nature. The empirical method has also been used in the study. The study depends on both primary and secondary sources of data. The primary data are obtained through questionnaire method. It is based on analytical research and telephonic interview is used to collect the information. To choose the interviewee, random sampling has been used. The secondary sources of data has been collected from relevant literatures, articles, journals, newspapers, books and e-resources etc.

Historical Perspective

The art of sericulture and use of various silk worms, threads and cottons for manufacturing different kinds of clothes and fabrics are known to the people of Assam since the time immemorial (Kalita:2018). In the Ancient Assam, according to the needs of time, the people used to produce their clothes either in their homes alone or in a group by their own, without depending on any machine or foreign produced clothes. In earlier times, in the rural areas of Assam, the skill of weaving used to be the primary qualification of a girl for her eligibility for marriage i.e. whether she knew the *bowa-kota* (spinning and weaving) (Gait:2008). The presence of the centuries old traces of handloom weaving in Assam can be found in the ancient scriptures like Ramayana, Kautilya's Arthasastra, Kalika purana etc. In Ramayana, there is a mention about *"the country of cocoon rearers"*, which is believed to be Kamrupa (i.e. Assam). The Katilya's Arthasastra also mentioned about the different kinds of silk garments used in Ancient Assam such as *ksauma (eri), dukula (muga) and patrorna (pat silk)* referring a place named *Suvarna Kundya,* which is believed to be the Sonkudiha of modern Kamrupa (Kalita:2018). References have also been made about fine stitched and

unstitched garments made of cotton, wool and Kosaja (silk from cocoons) etc. used in ancient Assam in the *Harsa Charita* and *Kalika Purana* (Assam State Gazetteer, Vol I, 1999). There is no doubt that the art of weaving was excellent in ancient Assam. But, the golden era in the history of handloom weaving began during the rule of Ahoms, i.e. in medieval Assam (1228A.D-1826A.D). The Ahom kings highly encouraged and supported a self-sufficient village economy by promoting the production of silks from locally produced natural fabrics (Handique:2016). During the rule of Su-Tu-Phaa (1369-1376 C.E), about one thousand families were associated with silk production in Assam villages (Barpujari,2007). The queen of Siva Singha, Sarbeswari even established a weaving school for providing training in weaving and designing cloths in the Ahom capital city of Rangpur (Handique:2016). King Rudra Singha also brought some new ideas and techniques for weaving into Assam from other parts India. During the rule of British colonial empire, some drastic changes occurred on the demand for the local handloom weaving cloths. There was a rapid decline in the demands for handloom products of Assam along with other parts of India. The local weavers of Assam had not only struggled against the unfair highly competitive situation but also against the middlemen, who tried to put the local weavers in perpetual debt trap. However, even before independence, Swadeshi Movement started by leaders like Gandhiji, highly encouraged the re-adoption of local handloom products and cloths instead of foreign manufactured machine-based cloths with a motive to make the country *Atmanirbhar.* But, after the independence, it was a turning point for the weavers and also it opened an opportunity in the hands of the newly formed government of independent India to take a step towards the protection of local handloom industries. Gradually, the concept of "Handloom Weavers' Cooperative Society" was also introduced in Assam through the "Assam Cooperative Societies Act, 1949" for more organized and strong units in handloom weaving sector. On the race of growing competitiveness in the textile industry in national as well as international market, an urgent need has been felt for strengthening the institutional arrangements to facilitate and encourage handloom weavers of Assam to cope with and challenge this competitive environment at global level. In the 20th century, the adoption of the State Handloom Policy, Assam in 2017-18 also had a deep impact on the upliftment of this sector in Assam. The

policy was in effect from 1st December, 2017to 13th November, 2022. Besides all these state policies, the government of Assam has also taken the scheme of Swa Nirbhar Naari under the Atmanirbhar Bharat Abhiyan. The Assam government introduced the Swa Nirbhar Naari Scheme on July 19, 2022 to promote an environment of self-empowerment through improving the socio-economic status of Assamese weavers in both urban and rural areas.

Atmanirbhar Bharat Abhiyan and Swa Nirbhar Naari Scheme

From the outbreak of COVID-19 Pandemic in the year 2019, India has been facing consequent challenges on its way to become a self-reliant country. In order to fight against the COVID-19 Pandemic, which had made heavy loss for the country, not only affecting the public health but also brought grave consequences to the Indian economy, the Prime Minister of India Mr. Narendra Modi announced an economic package of INR 20 lakh, 97 thousand, 53 crores in May, 2020. The goal was to make a self – reliant India in its major economic sectors and also to make a foundation as a guard against the future geo-economic shocks. The Govt. of India, introduced many initiatives under the Atmanirbhar Bharat Abhiyan in order to reform infrastructure especially in India's cottage industry and the MSME sector which can be platform of vast employment opportunities. ABA is a new version of "Make in India" initiative, which has an objective to make India as the most preferred manufacturing destination. Some of the objectives of the abhiyan are as mentioned: To focus on the key sectors like semiconductors and MSME sector to achieve vision of an "Aatmanirbhar Bharat" (a self-reliant India), to introduce the National Floor wage for a providing minimum economic safety to the local labours. To provide an Occupational Safety, Health and Working Conditions (OSHWC)code facility in the hazardous work place, emphasizing on the labour reform laws, with a provision for Social Security Fund for informal employees, Transforming India into a global supply chain hub by providing local and regional manufacturers with loans, investment opportunities etc.; To promote local industry by providing them preference and a market to sale their products.

ANBA and Handloom & Textile Industry

The Atmanirbhar Bharat program for Handloom industry is largely based on the Gandhian concept of Swadeshi movement. The schemes or provisions related to the small local industries specially Handloom weaving and Textile sector are as follows :

(i) A Social media campaign #Vocal 4 Handmade was launched on the 6th National Handloom Day, 7th August,2020 by the GOI in partnership with all stakeholders to promote the handloom legacy of India and to ensure people's support for weaving community.

(ii) "Udyam Registration" for MSMEs in Handloom, handicrafts and agro-based production industries. The total number of Enterprises registered and number of women employed as per Udyam portal in Handloom, Handicraft and Agro Based Production sector in Assam as of Dec,2022, are 20,625 and 59,894 respectively.

(iii) For the ease-of doing businesses, the GOI after Covid-19, under ANBA, provided online marketing opportunities to the weavers and handloom producers.

Swa Nirbhar Naari Scheme – Weaving Assam's way towards Swa Nirbharata under the ANBA

Handloom production is a supplementary activity for most of households in Assam. Handloom industry is largest single item in cottage industry and form the second largest economic activity in Assam after agriculture (Handique: 2016). As from earlier times the handloom industry has been playing an important role in the economic and industrial development in the North-East region specially in Assam. By considering the importance of handloom sector in the way of making Assam a self-reliant region of India, Swa Nirbhar Naari Scheme was launched on 19 July, 2022 under the government of the CM of Assam Himanta Biswa Sharma. The scheme comes under the Department of handloom textiles and Sericulture, Govt. of Assam, mainly focuses on the handloom sector particularly for indigenous weavers. The objectives of the SNNS are :

(a) To assist the Assamese Weavers to produce more handmade silks and fabrics and support their families financially.

(b) To expand their businesses and reach them out to a global market.

(c) To provide them with an online portal of swanirbharnaari. assam.gov.in that will enable their goods to sell on a online platform with no intermediaries so that they can get full benefit from their production.

(d) To conserve the cultural heritage and encourage people who have inherited these skills from their ancestors.

(e) To enable the improvement of the rural economy through modern technology and to provide a good work culture by boosting production and quality of raw materials. (https://pmmodiyojana.in/assam-swanirbhar-naari-scheme/)

Moreover, the scheme will ensure that the procurement of the traditional handmade items like woven cloths is done directly from the weavers with no middlemen. The procurement process will be under the control of Directorate of Handloom & Textiles, Assam with the assistance provided by The Assam Apex Weavers and Artisans Cooperative Federation Ltd. (ARTFED) and Assam Government Marketing Co-operation (AGMC) in providing sufficient manpower. The scheme will be under the section 6(2) of the Assam Public Procurement Act, 2017 as a means for the promotion of domestic industry for welfare of weavers. (Swa nirbhar naari, Govt. of Assam, website). The provisions of the scheme are for example- (a) the scheme will cover around 31 hand woven items belonging to various communities in the state (b) After the products are bought by government agencies, they will sell them both inside and outside of the state making the hand-woven items, products of global market. (2024 pmmodiyojana.in). But there are some eligibility criteria for the scheme such as- (a) the beneficiary should be a resident of Assam only and (b) the recipient must be a weaver by passion.

Present Socio-Economic Status of the Weavers of Nagaon District

Most of the districts in Assam comprises of both tribal and non-tribal populations, out of which many communities have been engaged in the handloom weaving or traditional crafting skills from years to years. The Practitioners of this craft of handloom weaving area also present in Nagaon district, i.e. in the middle Assam. Nagaon district covers an area of 2,287 square kilometers, with a population of 1,55,889. The district is rich in hand woven fabrics like muga, pat (mulberry silk) and cotton from which the Assamese weavers produce beautiful designable mekhela, chaddars, shawls and the symbol of Assamese culture, "Gamocha". In most of the villages of the Nagaon district, there are peoples engaging in handloom skills specially for personal consumption of the households, but not basically for

the commercial purposes, out of which 70% of the households have the domestic looms. The weavers concentrated areas in Nagaon can be divide into various blocks and districts, such as Pakhimaria, Raha, Kathiatoli, Batadrava, Barhampur, Khagarijan and kaliabor etc. where almost 1000-1200 weavers are present in each block. By considering this high involvement of people in weaving in the mentioned areas of the district, the Government of Assam adopted various initiatives and undertakes handloom training centers in the district.

Table 1: Handloom and Weavers Development Centers/Units in Nagaon District

Centers/Units	Handloom Training Centers (HTC)	Handloom Training Institute (HTI)	Weavers Cooperative Society (WCS)	Handloom Production Center (HPC)	Weavers Extension Service Unit (WESU)
Total Number	5	1	40	1	5

Source : As per the data provided by District Handloom Office

There is a total of 5 (Five) Handloom Training Centers (HTC) in Nagaon district. These are: (1) HTC Kuwaritol, (2) HTC Raha, (3) HTC Kasomari, (4) HTC Hatishung and (5) HTC Dakhinpat. The eligibility for the enrollment in this training centers are –(a) unmarried and (b) Students from class 8 up to degree. These training centers provide for a course of 1 year with a monthly stipend of 80 rupees. After the completion of the training, a person is eligible to have self-employment i.e. to establish their own handloom industry. Moreover, there are a total of 40 registered Weavers Cooperative Societies as per Weavers Cooperative Society Act of 1951, with 100 members in each society, operated by a 10 members Committee. There are a more than 50 SHGs and individual Entrepreneurs present in Chandanpur, Kosugaon etc.

Status of Weavers before the Implementation of Swa Nirbhar Naari Scheme

The SNNS is a state sponsored scheme for the weavers, implemented by the Directorate of Handloom & Textiles, Govt. of Assam on July19, 2022, focusing on the vision of Atmanirbhar Bharat Abhiyan. As per the data collected from the sample area, before the implementation of the scheme of SNN:

(1) Around 12.5 lakh weavers were in unorganized sector.

(2) Most of them were wanted to continue the work of Handloom weaving, but they lack in sufficient money or wages to have proper raw materials.

(3) The weavers could not get a proper platform to sell their products.

(4) They did not have any official online account to globalize their production.

(5) They could not get minimum wages in return of their production due to the lack of connection between the government and the weavers.

The weavers were not able to expand their business and reach them out to a global market. As most of them did not have an official online account also to sell the products to government.

Weavers having an Online Market Base before SNNS in Nagaon

The weavers were not able to expand their business and reach them out to a global market. As most of them did not have an official online account also to sell the products to government.

Table 2 : Market Condition of Weavers before SNNS

Mode of selling	No. of Weavers	Percentage
With Intermediaries	28	87.5%
Without intermediaries (In Online Mode)	4	12.5%
Total	32	100%

Source : Authors' own calculation

A Demographic Profile of Weavers before the SNNS

As per the 4th National Handloom Census, conducted in 2019-20, the status of Assam's Handloom Industry before the SNNS, can be shown as below: (in Lakhs)

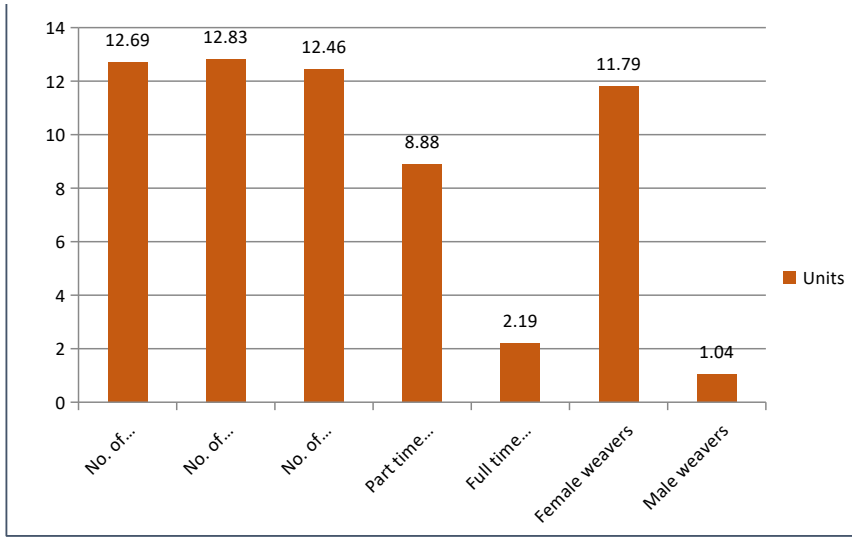

Figure 1: Assam's Handloom Industry before SNNS. *Source : Authors' illustration*

From the above data, it is clear that the number of full-time weavers is lower than part time weavers. Many surveys conducted on the reason of this decrease in the number of engaged full time weavers, partially agrees that the lack of a proper a market base and a minimum wage, is the main reason behind it.

Present Status of Weavers in Nagaon after the Implementation of Swa Nirbhar Naari Scheme

The SNNS is such a scheme of Govt. Of Assam, that aims to organize around 12.5 lakh unorganized weavers. Fulam Gamocha, Koch Rajbongshi Gamocha, Tiwa Fali, Karbi – Poho, Mising Dumer, Silk Gamocha etc. are the products that has been selected to be procured from the weavers.

In all over Assam, 6 lakhs, 20 thousand weavers are registered in the portal of SNN (i.e. https://swanirbharnaari.assam.gov.in.) in two phases.

Table 3 : Handloom Sector of Nagaon District under the SNNS

SNNS / Portal	Application Received	Approved (Identified as weavers)	Rejected	Procured	Product submitted	Payment to Weavers
No.	17,634	16,582	1052	261	8,581	16,74,370

Source: Swa Nirbhar Naari Portal, Govt. of Assam

As of January, 2024, in Nagaon, a total of 17,634 applications are received and out of which 16,582 were identified as weavers under SNN portal registration. An amount of Rs.16,74,370 payment was given to the weavers from 2021 to 2024. This was an achievement under SNNS in providing the weavers, their due return or wages for their production.

Age Groups of the engaged Weavers

The future scenario of a industry, depends on the number of new generation members involved in it. In that way, the future of Handloom industry depends on the age groups, engaged with it. The table and figure below illustrate the engaged weavers age groups from the sample :

Table 4 : Age Group of Weavers

Age Groups	No. of weavers	Percentage
Below 18	2	6.2%
18-30	6	18.75%
30-40	15	46.8%
Above 40	9	28.1%
Total	32	

Source: Field survey

Source of their Skill on Handloom Weaving

The skill of the weavers on Handloom weaving in the sample areas is basically based on government training, inherited skill from ancestors and from other sources like in various NGO courses. The below figure shows the ratio:

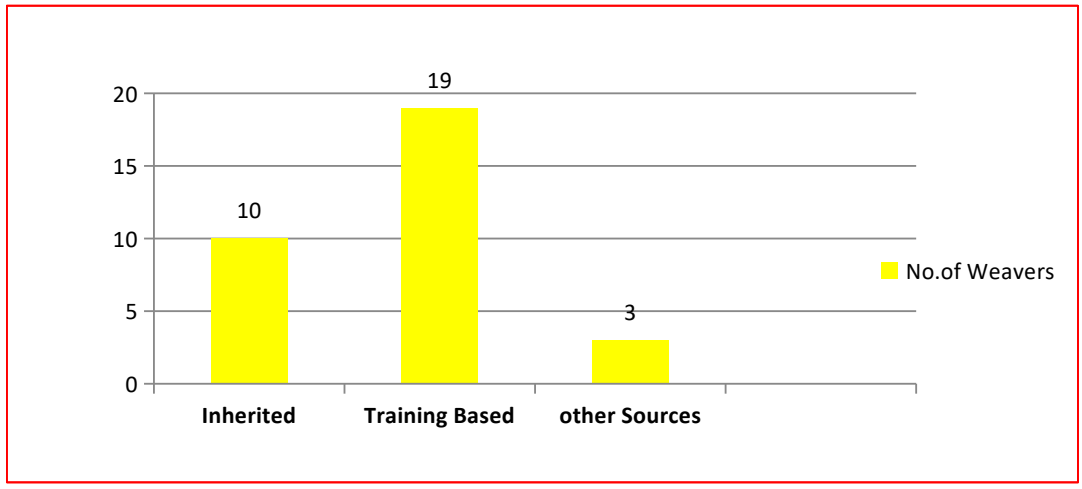

Figure 3: Source of Weaving Skill. *Source : Authors' illustration*

From the above figure, it can be drawn that the training-based weavers are largely engaged in the area than those inherited. According to the data collected, annually about 15 students are trained in the HTCs and about 40-50 students pass out from HTI in Nagaon District.

Weavers' Market base after getting Registered in SNNS

Starting from 2022, till January 2024, the weavers in the sample area, has been selling their products in three modes. As shown below through a table and a figure:

Table 5 : Weavers' Market Base after SNNS

Modes of Marketing	No. of Weavers	Percentage
Mostly Online	19	59%
Mostly Offline	3	9%
Both Online and Offline	10	32%

Source : Authors' calculation

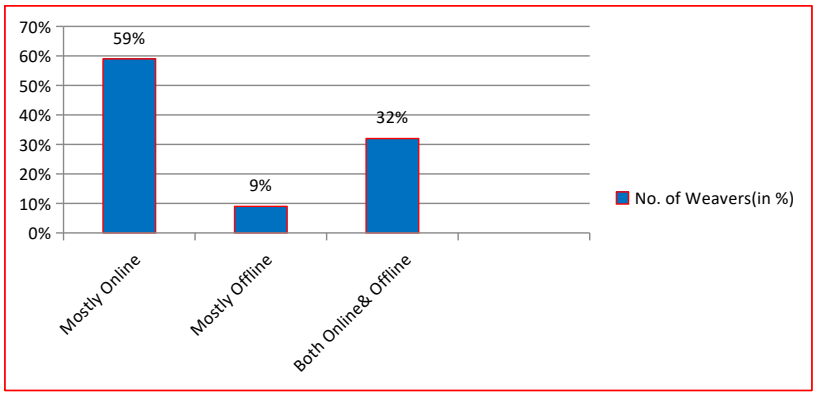

Figure 4 : Weavers' Market Base after SNNS. *Source : Authors' illustration*

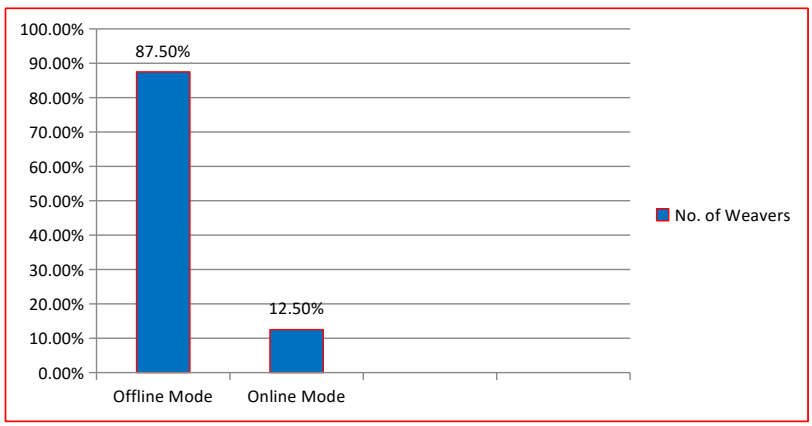

Figure 5: Weavers' Market Base before SNNS. *Source : Authors' illustration*

Weavers' Income

As per the data provided by District Handloom Office of Nagaon, through the implementation of the scheme, weavers' households' income increases from Rs.12,500 to 16,600 per month. The level of income of the weavers' households, is shown below :

Table 6 : Level of Income of the Weavers' (Yearly)

Income level / (Increases by	Less than 5,000	5,000-10,000	10,000-20,000	Above 20,000	No increase
No. of Weavers	3	12	13	4	0

Source : Authors' calculation

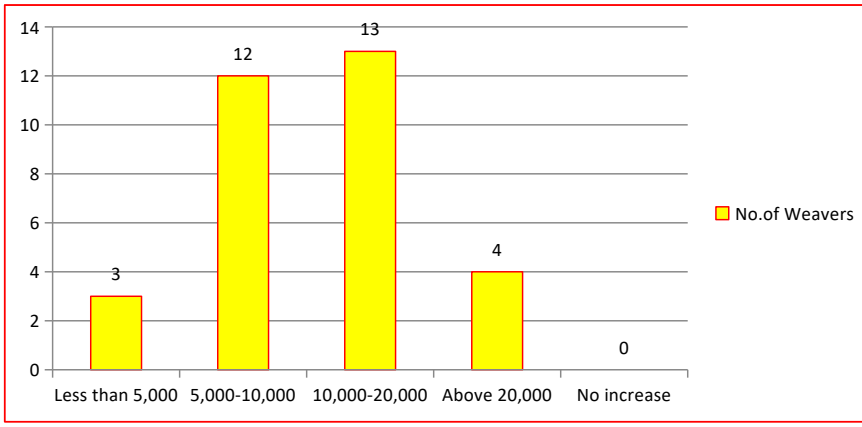

Figure 6 : Level of Income. *Source : Authors' illustratiion*

Challenges

During the baseline survey of the weavers' household in the sample area, it was noticed that even after the implementation of various government schemes, like Swa Nirbhar Naari, the weavers are still facing some fix challenges from the last two decades, which cannot be ignored. Some of the challenges are identified from the concerned field study. Those are:

1. Maximum number of weavers, use to produce fabrics in Country loom, which basically means they use betel nut tree as posts and bamboo reeds, which acts as a barrier in producing fabrics in high quantity and also hampers the cloth quality.
2. Due to globalization and liberalization, the Assamese local weavers have continuously been facing challenges because it is creating a high-level competition with the foreign low-priced products.
3. There is a lack of advertisements of the local products. Unfortunately, the advertisement rate of local handloom products is very lower than the foreign power loom-based fabrics and cloths. Because of which the customers, even the local people get unaware of the production of handloom cloths in their locality.
4. A lower stipend amount to the trainees in training centers, discouraged the students to go and enroll themselves in such training centers.
5. Lack of use of power looms, which

can produce quality products at larger quantity, completes the production in less time and can be sold in an affordable rate. Because of which, it makes the handloom products, time consuming, less in quantity and highly costly.

6. The weavers sometimes do not get their due wages or income in return of their hard work. Because of which some of the families creates a mindset of leaving their aged old tradition of Weaving.
7. Even after two years of implementing the SNNS, some of the weavers in rural areas are not organized in a proper way, making their production, a wastage of labor. Some of them even don't know about the facilities of the scheme of SNNS.

The figure below signifies the challenges faced by respondents to continue their work :

Table 7: Challenges Faced by the Weavers

Reason	Family Issues	Financial Problem	Lack of raw materials	Lack of people	No problem
No. of Weavers	4	8	11	3	6

Source : Field survey

The above data has been collected from the sample areas. Among the 32 respondents, a total of 26 weavers responded on the part of their challenges and 6 had no any major problem or challenges in continuing the weaving process. Among the respondents, most of them are facing problem mostly in raw materials and financial matters.

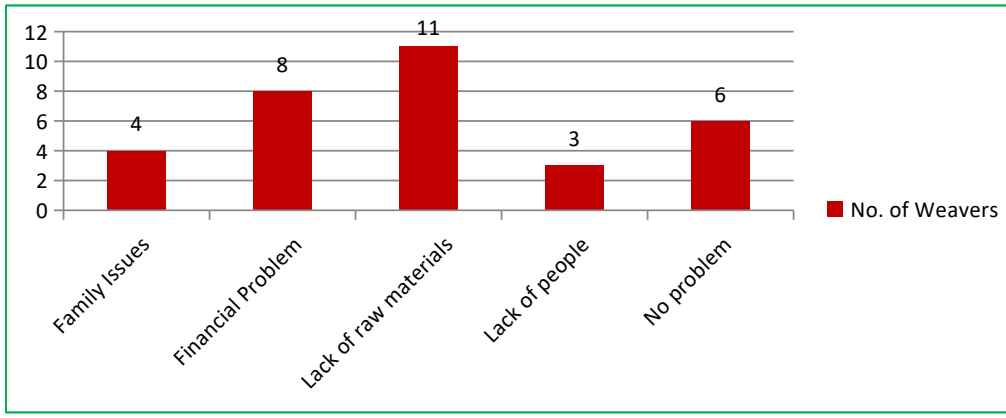

Figure 7 : Challenges Faced by Weavers. *Source : Authors' illustration*

The handloom sector of the Raha block along with some private handloom industries in the Nagaon town area gives a unique identity to the Nagaon district, by making it one of the re-known places for handlooms and handicrafts. Annually, the looms of Nagaon district produces around 8,581 handloom products locally on Pit loom frames. By further implementing the procedures under the SNNS, the Handloom Industry of Assam can be an important and powerful sector for the economic development of the state in near future. However, there are still some challenges faced by the weavers not only in Nagaon but also in the other weaver concentrated areas in the state. There is an urgent need on the part of government to find a solution to these problems, by considering the importance of the handloom sector.

Conclusion

The study comes with a number of conclusions or findings based on the interview of the respondent weavers in the selected sample areas. The age-old tradition of handloom weaving, and the traditional weavers are having a new identity as prestigious weavers. As said by Mahatma Gandhi, *"Assamese women are born weavers, they can weave fairy tales in their cloth"*.

The data collected from the field has shown that around 30-40 people are engaged in the handloom sector in most of the villages of Nagaon district from years. But because of the lack of adequate income generation from this skill-based production, many families who used to produce this kind of cloths earlier, has left the tradition. Some of the old methods of framing the looms like using betel nut tree as posts, and bamboo reeds etc. makes the quality of cloths thicker than power loom-based cloths and it hampers in producing larger quantity of fabrics. Besides all these situations the concerned department officials have tried their best to upgrade the quality and quantity of production by giving the weavers an income source. The Handloom Training Centers (HTCs) have contributed in a large scale in generating the new generation weavers by providing them skill-based training. However, positive impacts of the Swa Nirbhar Naari (SNNS) scheme on the socio-economic development of weavers cannot be denied, as due to account activation of a large number of unorganized skill-based weavers have resulted in increase in income generation than previous decades. There is no doubt that they can now have at least a minimum wage by selling the products even to the government department.

Based on the above findings and

by examining the problems faced by the weavers, the following suggestions can be made :

- The weavers should get sufficient raw materials for the production of new designable and upgraded cloths.
- The government Officials should take a step ahead towards introducing new designs and methods for the weaving, in order to get rid of the older irrelevant methods.
- An adequate stipend should be given to the weavers at the time of their training.
- More initiatives should be taken for the advertisement of those local handloom products, so that the people can aware of the production of such high-quality fabrics.
- The most urgent need is the introduction of some patent laws or GI tags to the local products including handmade cloths also.
- Measures should be taken to make the art of handloom weaving as a profession like other jobs for the youth.
- There is a need to ensure the minimum facilities for the weavers, who try to submit their products through SNNS.

These are some of the measures that can help to improve the position of handloom industry of Assam. Also, the handloom sector can become a means for economic development of the whole country.

References

Assam State Gazetteer. (1999). Google Books.

https://books.google.co.in/books?id=x-y5uAAAAMAAJ&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=-false

Atmanirbhar Bharat Package. (2022, December 8). https://www.pib.gov.in/PressReleasePage.aspx-?PRID=1881706

Borpujari H.K (2017). The Comprehensive History of Assam. Vol.1. Publication Board of Assam, Guwahati.

Chaudhari P.C (1995). *The History of Civilization of the people of Assam*. DHAS. Guwahati.

Directorate of Tourism, Government of Assam. (2023). Annual report. http://directortourism.assam.gov.in

Fernandance, Foziya. (2022). Economic Growth & Handloom Industry in Current Scenario: Economic Concept. Eco Matemático. 2. 677-688.

Gait Edward (2008). A History of Assam. EBH Publishers. Guwahati.

Government of Assam. (n.d.). Swanirbhar Naari. https://swanirbharnaari.assam.gov.in

Handique, J. K. (2016, January). An appraisal of the handloom industry in Assam. *Social Science Journal of Gargaon College, 4.*

Handloom and Sericulture Department, Government of Assam. (2017-18). http://hts.assam.gov.in

Handloom Census of India 2009-10. (2010). Office of the Development Commissioner for Handlooms, Ministry of Textiles, Government of India. https://handlooms.nic.in/assets/img/Statistics/Handloom%20report.pdf

Jain, L.C. (2007). The Issue is Employment". *Yojana.* Vol. 51. Ministry of Information and Broadcasting. New Delhi.

Kalita Jyotimonjuri (2018). Weaving in Colonial Assam: A Study in Historical Perspective. *International Journal of Creative Research Thoughts* (IJCRT). IJPUB1802010. Vol.6 ; 2.

Ministry of Textiles, Government of India. (2025). Annual report 2024-2025. https://ministryoftextiles.gov.in/sites/default/files/MOT%202024-25%20English%20Report%2012.03.2025.pdf

Official website of Ministry of Tribal Affairs , Govt. of India : "Atmanirbhar bharat abhiyan" https://tribal.nic.in/atmanirbhar-bharat.aspx

Patra, Samira. (2022). A Study on Impact of Atmanirvar Bharat on Handloom Weavers of Odisha. ComFin Research. 10. 8-16. 10.34293/commerce.v10i2.4784.

Sarmah, D. K. (2006). Women weavers in the handloom industry of Kamrup district of Assam: A socioeconomic and demographic study [Doctoral dissertation, Gauhati University]. Shodhganga. https://shodhganga.inflibnet.ac.in

Sentinel Digital Desk. (2019, September 29). Much before 'Make in India', Mahatma Gandhi taught Self-Reliance. *The Sentinel - of This Land, for Its People.* https://www.sentinelassam.com/topheadlines/much-before-make-in-india-mahatma-gandhi-taught-self-reliance

Sur, Debasish & Sourav Prasad (2020). Atmanirbhar Bharat Abiyaan: A Critical Appraisal. BANIJYA

(A Peer Reviewed & Refereed Journal), Vol.13, No.01.

Textiles Committee, Government of India. (n.d.). Textiles Committee: Home. https://textilescommittee.nic.in

The State Handloom Policy, 2017-18, Government of Assam. (2017). Directorate of Handloom & Textiles, Government of Assam. https://dht.assam.gov.in/sites/default/files/swf_utility_folder/departments/dht_medhassu_in_oid_4/menu/document/the_state_handloom_policy_assam_2017.pdf

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

The Great Nicobar Project: A Political Economy Review of Development, Environment, and Indigenous Rights in India's Island Frontier

Niranjan Borah[1*] and Gitanjali Borthakur[2]

Accepted : 11 July, 2026

Abstract

The Great Nicobar Project (GNP) stands at the intersection of India's developmental nationalism, ecological fragility, and indigenous vulnerability. It's a ₹ 72,000 crore megaproject under NITI Aayog's 2021 blueprint. The GNP aims a transshipment port, dual-use international airport, township, and power infrastructure on the Island. The Great Nicobar is located strategically near the Malacca Strait which is one of the busiest maritime routes in the world. Officially justified as a step toward strengthening India's maritime and geopolitical status in the Indo-Pacific area, the project is not merely an infrastructural undertaking but also

*Correspondence :
Email : niranjanborah772@gmail.com

[1]Department of Economics
Nagaon University, Nagaon, Assam-782001

[2]Department of Political Science
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

a deep socio-ecological transformation of one of the country's most biodiverse and culturally sensitive regions. This paper uses an interdisciplinary political economy framework that synthesizes Amartya Sen's capability approach, David Harvey's concept of accumulation by dispossession, and theories of institutional environmentalism to critically examine the developmental, ecological, and ethical implications of GNP. Picking up from various governmental reports, environmental clearances, human rights analyses, academic literature, and investigative journalism, this study emphasizes how state-led accumulation and strategic narratives intersect with fragile ecosystems and indigenous rights. This argues that the GNP represents a contemporary form of strategic developmentalism, where economic growth and national security incorporate legitimate environmental degradation and social marginalization. The paper concludes that while India's maritime aspirations are well-founded, the GNP broadens a development paradigm that risks undermining the very ecological and human foundations on which sustainable progress depends. Policy recommendations point out the need for participatory planning, holistic ecological assessments, and rights-based governance frameworks to align national development with ecological justice and human dignity.

Keywords Great Nicobar project; Political economy; Accumulation by dispossession; Environmental governance; Indigenous rights; Development ethics; Indo-Pacific

Introduction

India's contemporary development trajectory increasingly mesh up economic aspirations with geopolitical needs. This phenomena is rightly more visible in the Great Nicobar Project (GNP), a flagship infrastructure initiative proposed by the Government of India (GoI) for Great Nicobar Island in the southernmost part of the Andaman and Nicobar archipelago. The island's geographical proximity to the Malacca Strait renders it an immense strategic value as nearly 40 percent of global maritime trade passes through it (Raja Mohan, 2012). The GNP was conceptualized in 2021 as part of NITI Aayog's "Holistic Development of Great Nicobar Island" plan. GNP is aiming to convert this ecologically rich but randomly populated region into a global hub for maritime logistics, defense operations, and international trade (NITI Aayog, 2021). The project's principal components are a deep-draft transshipment port at Galathea Bay, a dual-use international airport, a

widespread township, and integrated energy facilities. All these components together signify the state's intention to reposition the island within India's broader maritime and strategic framework.

However, the GNP is more than a developmental blueprint where it opens a new horizon of debate that competing logics of growth, ecology, and rights collide with each other. The Shompen and the Nicobarese are two indigenous habitat groups of the island whose cultural practices, subsistence economies, and spiritual worldviews are inextricably linked to the island's forests and marine ecosystems (Anthropological Survey of India [ASI], 2022). Moreover, greater than 85 percent of the island's area remains covered by dense tropical rainforest that forms the part of the UNESCO-recognized Great Nicobar Biosphere Reserve (Wildlife Institute of India [WII], 2022). These attributes point to the island as it's not solely a strategic asset but also a delicate ecological frontier, whose transformation under the rhetoric of development invites scrutiny into the ethics and governance of India's contemporary developmental state. That's why the GNP serves as an empirical site for exploring the contradictions of developmental nationalism where the state-led accumulation is pursued under the dual banners of progress and patriotism, even at the expense of ecological stability and human rights (Harvey, 2003; Xaxa, 2003). This paper seeks to unfold these contradictions by interrogating the political economy that holds up the project's conception and implementation.

Theoretical Framework: Development, Dispossession, and Institutional Ecology

It is an analysis underpinned by a triangular theoretical framework that combines Sen's capability approach and Harvey's theory of accumulation by dispossession with institutional environmentalism. The combination of the approaches reveals how development-framed necessity-destiny obscures processes of marginalization and ecological appropriation.

The capability approach, advanced by Amartya Sen (1999), provides a normative grounding for assessing how development expands or shrinks human freedom. For Sen, development has to be understood as an expansion of substantive capabilities, that is, the capability of persons and communities to lead lives they find valuable. Applying this vision to the Great Nicobar Project, one has to raise some very pertinent questions: does the project expand the capabilities of the

Shompen and Nicobarese to subsist, to govern themselves and to maintain cultural continuity, or does it shrink their freedoms through dislocation, environmental deterioration and loss of autonomy? As already mentioned, Sen's framework shifts the highlight of development away from macroeconomic indicators of national income to the micro lense of people's lived experiences and the quality of freedoms enjoyed. A development which reduces participation or jeopardizes survival cannot be called just, irrespective of GDP leap or level of strategic success.

Complementing this is the structural critique of David Harvey (2003) about accumulation by dispossession, pointing to how such mega projects are enabled. Harvey contends that under neoliberal capitalism, states often facilitate a process in which common or communal resources- land, forests, water- are transformed into private or state controlled capital in the name of modernization and for the public good. This leads to a new form of primitive accumulation packaged as development. This dynamic can be seen in the case of the Great Nicobar Project. As part of this project large tracts of forest have been declassified, tribal lands reclassified and environmental norms relaxed to facilitate infrastructural expansion. Such moves reflect what Peet and Watts (2004) term "liberation ecologies"- the struggle over who controls nature and for whose benefit. In the GNP, nature becomes an asset to be managed for national prestige, while indigenous communities and biodiversity are rendered secondary.

The institutional environmentalism framework as elaborated by Lemos and Agrawal (2006), outlines how governance structures frame and condition environmental outcomes. In this context, Indian environmental governance is characterized by inconsistent jurisdictions, fragmented authority and selective enforcement. The course of the GNP as manifested in fast-tracked clearances, pro-forma consultations and limited transparency clarifies the way in which institutions might be mobilized in the service of the state's strategic priorities rather than environmental protection. Collectively, these frameworks illustrate how the Great Nicobar Project sits at the juncture of developmental aspiration and dispossession, facilitated by institutions that privilege growth over justice.

Methodology

This research adopts a qualitative and interpretive methodology with its core in the analysis of documents which is a critical discourse review. The study draws from the various government

documents in the form of the concept note by NITI Aayog (2021), clearance letters from MoEFCC(2022) and minutes of the Forest Advisory Committee as primary data sources. The Wildlife Institute of India(2022) and The Energy and Resources Institute, TERI (2024) provide scientific insight into biodiversity, seismic vulnerability, and ecological thresholds that complement as technical assessment. Secondary materials include inquiry based journalism from Mongabay India(2022-2024), Down to Earth(2023) etc. These secondary sources express the significant disconnections and differences between written documents and ground level realities. The research also goes through reports published by Human Rights Watch(2023) on indigenous consent and rights. The academic literature places GNP within the broader debates of development, governance, and the political economy of environmental change. Such a synthesis of sources allows one to capture how the multiple discourse systems of economic, strategic, and ecological frameworks that operate in favour of to legitimate or contest the project.

The Great Nicobar Project: Vision, Scale, and Developmental Logic

The Great Nicobar Project consists of four major components: an international transshipment port at Galathea Bay, a dual-use international airport, a new township for a projected population of 300,000, and integrated power generation facilities based on gas and solar energy (NITI Aayog, 2021). Taken together, these components are supposed to position India as a key maritime player in the Indo-Pacific, reducing dependence on overseas ports like Colombo and Singapore (Observer Research Foundation [ORF], 2022). It has been argued that more direct and indirect jobs will be created, with positive effects within logistics and tourism, leading to a new wave of regional growth. The economic rationale is from the logic of agglomeration economics (Krugman, 1991), which refers to the fact that investment in less-developed regions through infrastructure can create growth that is self-perpetuating.

Underlying these optimistic views, however, is a far more nuanced political economy. The absence of an industrial hinterland on the island, the paucity of freshwater supplies, and ecological fragility all undermine the long-term feasibility of the project. Critics have suggested that projections for growth in transshipment traffic seem highly inflated, which lends weight to the suspicion that the drivers of the project are strategic and symbolic rather than linked to economic

feasibility. In three decades, a projected population increase from 8,000 to 300,000 would mean tremendous change in the island's demographic character and unprecedented pressure on its ecosystems and governance structures. Down to Earth (2023) reported that the GNP represents a never-before-tried demographic experiment and has the potential to marginalize indigenous people through economic and political displacement.

The GNP is essentially not an infrastructure project, it is a manifestation of developmental nationalism, a vision of modernity that equates economic growth with national strength. This discourse mobilizes patriotic sentiment at the same time as masking asymmetries of power underwriting development. By linking ecological transformation to national security, the state legitimates exceptional measures by allowing for environmental clearances and land acquisitions with relatively little scrutiny (Harvey, 2003). In so doing, development becomes a performative act of sovereignty, holding control over territory and nature in the name of progress.

Environmental and Ecological Governance

Great Nicobar represents tremendous ecological importance. Its woods are inhabited by endemic species such as the Nicobar megapode, the crab-eating macaque, and the leatherback turtle; its coral reefs and mangrove ecosystems have important ecological roles in terms of the delivery of environmental services such as carbon sequestration and shoreline protection (WII, 2022). The tropical forests of the island are an important part of India's carbon sink necessary for climate regulation and biodiversity conservation. In contrast, the GNP proposes diversion of about 130 sq.km. of these primary forests, involving the felling of close to 850,000 trees (MoEFCC, 2022), thus making it one of the largest forest clearances in recent Indian history. According to environmentalists, compensatory afforestation outside the island cannot substitute for the loss of ancient tropical ecosystems that have evolved in isolation over millennia.

Methodological and procedural deficiencies in the EIA process of GNP have come under heavy criticism from different quarters. Reports by Mongabay India 2023 showed that the baseline ecological data was incomplete, multi-seasonal biodiversity studies were not carried out, and the consultations with experts and local communities were cursory. Despite such deficiencies, NBWL and MoEFCC granted approvals through an "environmental impact assessment"

and "wildlife clearance," usually citing "strategic national importance" for the said project. These are mere justifications indicating what scholars term "green authoritarianism" : a governance style in which environmental regulations are subordinated to state developmental imperatives.

The location of the island in a very high seismic and cyclone-prone zone further heightens its environmental vulnerability. The massive destruction caused by the 2004 Indian Ocean Tsunami in large parts of the Nicobar Islands reveals the vulnerability of large-scale coastal infrastructure in such locations. Notwithstanding this risk, disaster-risk modeling in GNP is superficial, and the climate resilience measures are ill-developed. Another critical concern at the national level, with regard to carbon emissions arising from the potential deforestation, is also in direct contradiction to India's commitment arising out of the Paris Agreement and the Sustainable Development Goals. Here, environmental governance seems more like a formality for administrative convenience in executing this project rather than as a mechanism of protection.

Indigenous Rights and the Politics of Exclusion

The GNP's social implications are as profound as its environmental ones. The population numbers of the Shompen and Nicobarese communities are roughly 200–300 and 30,000 respectively. They have historically maintained co-existential relationships with their environment (ASI, 2022). The Shompen are categorized as a Particularly Vulnerable Tribal Group (PVTG) who live semi-nomadic lives in the island. They rely on hunting and forest produce. The Nicobarese are residing along coastal areas and engaging themselves in horticulture, fishing etc. They maintain intricate social and close networks tied to the landscape.

The Andaman and Nicobar Protection of Aboriginal Tribes Regulation (1956) legally safeguards tribal reserves from external interference. However, reports indicate that the principle of Free, Prior, and Informed Consent (FPIC) preserved in the United Nations Declaration on the Rights of Indigenous Peoples has been bypassed (Human Rights Watch, 2023). Official consultations have been limited and very rare evidence of meaningful participation by tribal councils can be noticed. In practice, development planning has proceeded through what Sen (1999) would describe as "unfreedom" means the absence of agency and choice in determining one's own future.

This exclusionary process

reproduces what Xaxa (2003) identifies as the colonial continuity of tribal administration in India. As per him indigenous peoples are "managed" as populations rather than recognized as political communities with inherent rights. The demographic transformation envisioned under the GNP where indigenous people would become a numerical minority that further exacerbates their vulnerability. Cultural dislocation, health risks from exposure to external populations, and the erosion of traditional knowledge systems collectively amount to what Harvey (2003) would term "accumulation by dispossession," not merely of land but of identity and history.

Economic Evaluation: Costs, Benefits, and Sustainability

As per the economic point of view, the GNP promises substantial benefits like improved maritime connectivity, employment generation and reduced dependency on regional hubs. Proponents argue that the port's operations could increase India's share of global container traffic as well as associated infrastructure could stimulate tourism and subordinate industries (World Bank, 2022). Still, ecological economics is aware that such calculations even externalize environmental costs. The destruction of coral reefs, deforestation, and habitat loss bring losses in ecosystem services which range from carbon sequestration to fisheries productivity that carry quantifiable economic value (United Nations Environment Programme [UNEP], 2023). Costanza et al. (2014) estimate that the global value of ecosystem services provided by tropical forests and coastal systems runs into billions of dollars annually. This economic ecological capital is irrationally sacrificed for short-term infrastructural gain.

Moreover, sustainability concerns extend beyond ecology to include fiscal and logistical potentiality. The high maintenance costs of remote island infrastructure along with limited freshwater availability and energy demands create doubt on the project's long-term viability(CSE, 2023). Without integrated planning, accounting for ecological carrying capacity, the GNP risks becoming an "ecological enclave economy" without integrated planning and accounting for ecological carrying capacity; which signifies a zone of extractive growth sustained by external subsidies but disconnected from its natural and social environment.

Geopolitical and Strategic Context

Strategically, Great Nicobar holds a pivotal position in the Indo-Pacific

maritime region. The islands are situated near the Malacca Strait which gives India an advantage over one of the world's busiest shipping routes. The GNP coincides with India's maritime security dogma coherently spoken in Ensuring Secure Seas (Indian Navy, 2021) and complements the SAGAR (Security and Growth for All in the Region) vision that both seeks to balance security with development. The project thus has an undeniable geopolitical value particularly in the context of China's growing naval presence in the region.

The eager need of strategic necessity can vague the developmental trade-offs involved. Comparative experiences from Sri Lanka's Hambantota port, China's artificial islands in the South China Sea, and Seychelles' infrastructure partnerships illustrate the risks of subordinating local governance and environmental safeguards to strategic agendas (Peet & Watts, 2004). In India's case the dual-use nature of the GNP as serving both civilian and military objectives obscure the boundaries between development and securitization. As environmental governance becomes subordinated to defense priorities where democratic accountability diminishes. So, due to the priority for national defense, strategic developmentalism privileges geopolitical signaling over ecological sustainability and social inclusion.

Governance, Institutions, and Policy Architecture

The governance structure of the GNP depicts the institutional logic of India's developmental state. The project is conceptualized by NITI Aayog and the Andaman and Nicobar Islands Integrated Development Corporation (ANIIDCO) is responsible for the implementation. The regulatory oversight of GNP lies with the Ministry of Environment, Forest and Climate Change (MoEFCC) and the Union Territory administration. However, the coordination among these institutions remains fragmented and decision-making is in the hands of the central level authority (TERI, 2024). The Environmental and forest clearances have been accelerated in the name of "strategic national importance" that effectively minimizes independent scrutiny. This systematic acceleration reflects what Jessop (2002) calls "state selectivity" which indicates the prioritizing of certain institutional pathways that favor capital accumulation and strategic objectives over participatory governance.

The absence of a comprehensive island management policy or cumulative impact assessment further reveals institutional brittle. Environmental

monitoring procedures are weak and have lesser coordination at the inter-agency level. Such governance asymmetries provide grounds for ecological risk and social exclusion as local communities have limited access in decision-making processes. In effect, the GNP showcases how developmental states in the Global South often replicate the institutional features of neoliberal governance emphasizing centralization, technocratic rationality, and selective inclusion while it ironically claims to pursue holistic development.

Discussion: Political Economy of Development, Dispossession, and Resistance

The Great Nicobar Project represents a concentrated expression of the contradictions found in India's political economy of development in the twenty-first century. It was a result of a combination of neoliberal accumulation and nationalist aspiration-a case of "state capitalism"-which hides behind rhetorics of security and modernity for enclosure of the commons. Harvey's (2003) conception of accumulation by dispossession was developed to explain the process by which ecological and cultural resources become strategic assets. Forest clearance, land acquisition, demographic engineering, etcetera, are mere means to take over the island's social and ecological landscape for global capital and state power.

At the same time, the project represents a broader ideological turn in India's development discourse. As infrastructure is made to be an issue of patriotic duty, any making of dissent amounts to disloyalty that closes down democratic spaces of contestation (Baviskar, 2020). Environmentalists and anthropologists critical of the project are regularly portrayed as anti-development or anti-national, further eroding deliberative forms of governance. Similar trends exist around the world in developmental authoritarianism wherein states frequently invoke specters of economic or geopolitical existential threats as pretexts for extraordinary interventions into nature and society.

Through the lens of Sen's capability

Beyond being an approach, the GNP also epitomizes the moral paradox of contemporary development: at the same time as promising modernization, it constrains the capabilities of its main subjects. Indigenous peoples lose the land and, with it, the ability to exercise agency and preserve cultural identity. The so-called "freedom to develop" is transformed into a narrative that excludes those without voice. In this

respect, the GNP is not an anomaly but the symptom of a more general paradigm of development that equates control over territory with control over one's destiny.

Conclusion and Policy Implications

The Great Nicobar Project in such a way crystallizes the risks of the Indian developmental future. Its stated objectives of economic modernization, strategic security, and regional integration are indeed consequential, but along with this such objectives are pursued several critical, ethical and ecological questions. As demonstrated here, the economic rationale of the GNP is inseparable from its geopolitical intent. Environmental governance has been compromised by institutional advantageousness. So, its treatment of indigenous rights remains inconsistent with both domestic law and international norms.

Different policy measures are required for India to reconcile growth with sustainability and environmental justice. In the first place, impact assessment analyses should precede implementation so that environmental impact can be minimalized. Independent and transparent ecological studies can be vital in evaluating ecological sustainability. Secondly, to make the process democratic and accountable. The principle of informed consent must be institutionalized. One way of doing so is to empower indigenous councils which represent and protect indigenous identity. Thirdly, a strong legal-institutional framework for management of the island should be established by incorporating biodiversity protection, climate resilience and participatory planning. Fourthly, environmental accounting processes should be improved and should involve the valuation of ecosystem services to internalize costs and traditionally externalize them in economic models (UNEP, 2023). Finally, India's maritime strategy must align with India's promises under the Paris Agreement. The Sustainable Development Goals must ensure that national security does not come at the cost of ecological security.

The Great Nicobar Project not only presents a standalone initiative of one particular nation but also reflects the tensions of twenty-first century development. It brings into light a clear concern whether the word 'sustainable' should incorporate progress which erodes ecological and cultural diversity. In the era of globalization and geopolitics, real measures of progress will not lie only in ports and airports but also in the preservation of natural and human diversity. Thus, the Great Nicobar Project presents both warning and opportunity for India- warning against development

uncritical of the environment and an opportunity to redesign the concept of progress by incorporating principles of ecological justice and human freedom.

References

Anthropological Survey of India. (2022). Tribal groups of the Nicobar Islands. ASI Publications.

Baviskar, A. (2020). Uncivil city: Ecology, equity and the commons in Delhi. Sage Publications.

Centre for Science and Environment. (2023). Environmental assessment of Great Nicobar development project. CSE Report.

Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., ... & Turner, R. K. (2014). Changes in the global value of ecosystem services. Global Environmental Change, 26, 152–158. https://doi.org/10.1016/j.gloenvcha.2014.04.002

Down to Earth. (2023). Great Nicobar: Counting the ecological cost. Centre for Science and Environment.

Harvey, D. (2003). The new imperialism. Oxford University Press.

Human Rights Watch. (2023). India: Indigenous rights at risk in Nicobar Islands. HRW Report.

Indian Navy. (2021). Ensuring secure seas: India's maritime security strategy. Government of India.

Jessop, B. (2002). The future of the capitalist state. Polity Press.

Krugman, P. (1991). Geography and trade. MIT Press.

Lemos, M. C., & Agrawal, A. (2006). Environmental governance. Annual Review of Environment and Resources, 31(1), 297–325. https://doi.org/10.1146/annurev.energy.31.042605.135621

Ministry of Environment, Forest and Climate Change. (2022). Environmental clearance letter for Great Nicobar Project. Government of India.

Mongabay India. (2022–2024). Investigative series on the Great Nicobar Project.

NITI Aayog. (2021). Holistic development of Great Nicobar Island. Government of India.

Observer Research Foundation. (2022). India's maritime infrastructure and the Indo-Pacific strategy. ORF Policy Brief.

Peet, R., & Watts, M. (2004). Liberation ecologies: Environment, development, social movements (2nd ed.). Routledge.

Raja Mohan, C. (2012). Samudra manthan: Sino-Indian rivalry in the Indo-Pacific. Carnegie

Endowment.

Sen, A. (1999). Development as freedom. Oxford University Press.

TERI. (2024). Island governance and sustainability in India. The Energy and Resources Institute.

United Nations Environment Programme. (2023). Economic valuation of ecosystem services. UNEP Report.

Wildlife Institute of India. (2022). Assessment of biodiversity in Great Nicobar Island. WII Technical Report.

World Bank. (2022). Blue economy and coastal development report. World Bank Publications.

Xaxa, V. (2003). Tribes and the Indian state.Economic and Political Weekly, 38(27), 2839–2845.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

The Koch Rajbanshi Identity Movement and Its Prospects in Assam

Paresh Borah[1*]

Accepted : 11 June, 2026

Abstract

Identity consciousness is one of the important issues that promote the politics of identities and leads to identity-based movements. This paper aims to understand the identity movement and its future by an ethnic group known as Koch Rajbanshi in Assam. Identity assertion by any ethnic group is born out of social, economic, cultural and political deprivations as perceived by the respective group. In the multi-lingual, multi-ethnic and multi-cultural landscape of Assam, the emergence of identity movements of different ethnic groups lead to a lot of serious issues ranging from terrorism, economic stagnancy, cultural threats, and political instability. The issue of Koch Rajbanshi's identity has already transcended the limit of a mere identity movement and has turned out to be a major catalyst of the socio-political scenario of the state. Demands of their movements include a

*Correspondence :
Email: pareshpolsc@gmail.com

[1]Department of Political Science
Rangapara College (Autonomous), Sonitpur, Assam-784505

Published offline : 7 August

range of crucial issues like the demand for separate statehood, demand for Schedule Tribe status, recognition of their language, economic protection, socio-cultural improvement, etc. Interviews conducted with hundred individuals, representing multiple backgrounds emerge to be integral in understanding and articulating these demands.

Keywords Identity movement; Koch Rajbanshi; Kingdom of Kamatapur; Separate statehood; Schedule Tribe status

Introduction

Assam is the most populous state amongst all the North-eastern states. Over a long period of time, many tribal and non-tribal population have been living in Assam such as Assamese, Koch Rajbanshi, Bodo, Kachari, Sonowal, Mishing, Rava, Deuri, Barman, Chakma, Dimasa Kachari, Garo, Khasi, Hajong, Hojai, Kuki, Mech, Karbi and others. Society in Assam has historically been multi-racial, multi-religious, multi-ethnic, multi-caste, multi-class, and multi-lingual in composition (Hussain, 1993, 2000). The genesis of ethnic conflicts and ethnic identity movements in the state lies in its colonial past and the British policy of 'divide and rule' (Kumar, 2007: 111-112). In spite of divided many times based on ethnic identity, the demands such as constitutional safeguard, creation of separate statehood, etc are continuing among many plain and hill tribes. For instance, the Karbis of Karbi Anglong district and the Dimasa Kacharis of Dima Hasao Autonomous District have been agitating for granting of a separate state based on their ethnic identities. From the 1980s onwards the Bodos have been demanding a separate Bodoland state based on their linguistic and ethnic identities. Similarly, the Koch Rajbanshis are demanding 'Kamatapur' as a separate state for preserving their distinct identities and political entities, etc.

Thus, each community in Assam has its own history which has precipitated its identity crisis and led it to the path of movement. Koch Rajbanshi is an ethnic community and earliest inhabitant of Assam. Historically this community has the features of Austral-Asiatic or Adivasi, Dravidian, Mongoloid, and Aryan, mixed up with all four human streams or cultures but Mongoloid features were pre-dominant (Ray, 2007: 9). Usually, this community has been living in whole of North Bengal barring its hilly terrains; in a sizable portion of Assam; western part of Meghalaya; Purnia, Kishanganj districts and eastern part of Katihar district of Bihar; Jhapa and Biratnagar districts of Nepal; Rangpur,

east Dinajpur district and some parts of northwest Mymensingh, northern Rajshahi and Bogra districts of present-day Bangladesh and lower parts of Bhutan. They are known as Rajbanshi Kshatriya Bengali in North Bengal, simply Rajbanshi in Bihar and Nepal and as Koch Rajbanshi in Assam, Meghalaya and their adjoining areas (Ray, 2007: 8). Assertion of identity and aspiration of the Koch Rajbanshis, in revolt against their perceived socio-economic and politico-cultural deprivation, had begun during the post-independence period, particularly in the 1980s. Now in both the Indian states of West Bengal and Assam, the Koch Rajbanshis are fighting for a greater separate Kamatapur state. They also have a demand to include their language in the Eighth Schedule of the Constitution of India along with ST status for those living in Assam and socio-economic development of this community (Rai, 2002). The study examines the factors leading to Koch Rajbanshi's identity movement.

Methodology of the Study

The article is primarily based on the findings of a field study conducted during the month of July and August 2015 through a semi-structured interview schedule. Interview both personal and group have been taken from the members of different socio-political organizations of Koch Rajbanshi i.e. All Koch Rajbanshi Students Union, All Kamatapur Students' Organization, All Assam Koch Rajbanshi Yovo Chatra Sanmilani, Centre for Koch Rajbanshis Studies and Development (Trust) and Kamatapur Peoples Party including few respondents from the common villagers in the lower parts of Assam. To understand the root of the problem and its magnitude and impact in the present-day context, the present study has adopted historical and analytical methods of research respectively. It is generally felt that only a section of the population will have an extensive knowledge about the problem of the Koch Rajbanshi, related to identity issues, therefore the study has applied purposive and snowball sampling for selecting the respondents. For the purpose of the present article and to examine the autonomy movements led by the Koch Rajbanshis to negotiate their issues of identity, the recent data drawn from diverse sources such as books, journals, magazines, news papers, government reports, census data, memoranda, and constitutions of socio-political organisations has been complemented by the findings of the field survey.

Findings from the Field Study

The 2015 study interviewed

hundred individuals representing multiple backgrounds in the lower parts of Assam. Of the total respondents, 70 per cent belonged to the member of socio-political organisations and 30 per cent was common villager. In order to study the nature of consciousness of the Koch Rajbanshis about their identity and how they see their own identity, they were asked to identify the identity that they would like to consider in their social life. 86 per cent of the respondents felt that 'Koch Rajbanshi' is their identity in their social life. 9 per cent opined 'Assamese' as their identity and 5 per cent as 'Bengali'. In fact, it was observed that most of the people were aware of the fact that they speak Koch Rajbanshi language and their identity is Koch Rajbanshi.

In order to know the opinion of the respondents about Kamatapur, they were asked to identify what Kamatapur actually means to them. In response 21 per cent respondents opined that Kamatapur is a royal state for them, while 47 percent felt that Kamatapur is a historical state for them. However, 32 per cent of the respondents agreed that Kamatapur is a royal as well as the historical state for them. In fact, it is observed that most of the Koch Rajbanshi interviewees felt proud to be calling themselves as Kamatapuri. Kamatapur was their historical kingdom where Koch king ruled for a long period of time. They felt proud anticipating the glorious past history of Kamatapur or Koch kingdom and considered it as a royal kingdom where the power of Koch Kingdom was established in entire parts of the North-eastern region of India. Now Kamatapur does not exist but it is living in their historical imagination.

In response to the question, why Koch Rajbanshis are demanding Kamatapur, 11 per cent respondents felt that they wanted Kamatapur to avoid cultural differences. 21 per cent opined that they wanted Kamatapur to achieve development. 26 per cent of the respondents answered that they want Kamatapur because the identity of Kamatapur is the identity of Koch Rajbanshis. 42 per cent respondents considered all the above mention factors are responsible because of which they want Kamatapur as a separate state.

In response to the question, what are the causes responsible for the Kamatapur Movement, 21 per cent of the respondents opined that the ethnic identity crisis of the Koch Rajbanshis is one of the sole cause responsible for the Kamatapur movement while 9 per cent of the respondents identified land alienation as an important factor responsible for the Kamatapur movement. 3 per cent of the respondents felt it was an impact

of colonial administration as a cause for the Kamatapur movement. Similarly, 16 per cent of the respondents considered wrong policies of the government were an important factor responsible for the Kamatapur movement while 5 percent considered that the Kamatapur movement was a creation of political elites. On the other hand, 3 per cent of respondents believed that the Kamatapur movement was a result of the impact of modern civilization. However, a majority of 43 per cent of the respondents opined that all the above-mentioned factors are responsible for the Kamatapur movement.

In response to the question on government response towards the Kamatapur movement, none of the respondents felt that the government response was positive. 96 per cent of the respondents opined that the response of the government was negative while a small number of the respondents (4 percent) opined that the response of the government was partially positive.

In order to assess the perception of the respondents about the impact of the Kamatapur movement on the socio-political life of the Koch Rajbanshis, the respondents were asked to identify whether the impact of the Kamatapur movement was positive or negative in their socio-political life. 11 per cent of the respondents opined that the impact of the Kamatapur movement was positive in the socio-political life of the Koch Rajbanshis. Whereas, 71 per cent of the respondents were in view that the impact of the Kamatapur movement was negative. However, 18 per cent opined that the impact of the Kamatapur movement was both partially positive as well as partially negative in the socio-political life of the Koch Rajbanshis.

In response to the question, what is the possible solution of the Koch Rajbanshis problem, 11 per cent respondents felt that the preservation and development of Koch Rajbanshis cultural identity is one step that can be taken as a possible solution to the Koch Rajbanshis problem while 19 per cent of the respondents opined that economic development of the Koch Rajbanahis is an urgent need to solve the problem of Koch Rajbanshis. On the other hand, 25 per cent of the respondents opined that the creation of a separate Kamatapur state is the only solution of the Koch Rajbanshis problem. Similarly, 7 percent suggested that check on land alienation of the Koch Rajbanshis will be an important step for bringing the solution to the Koch Rajbanshis problem. However, 39 per cent of the respondents opined that all the above-mentioned steps should be taken for bringing the solution to the

Koch Rajbanshis problem.

Factors Leading to Koch Rajbanshi's Identity Movement

In the course of the study, it was found that different socio-economic and politico-cultural factors are responsible for Koch Rajbanshi's ongoing autonomy movement. An analysis of these factors is crucial to understand the issues of their identity movement.

Historical Memory of Koch Kingdom

The present identity movement for separate Kamatapur state draws its inspiration from the historical memory of Kamatapur or Koch kingdom (Das, 2009). Kamatapur was a region where the Koch Kingdom ruled over for a long period of time. In the contemporary social and political discourse the Koch Rajbanshis feel proud to identify themselves with Kamatapuri and are fighting for the reconstruction of their Kamatapur state which is rooted in history. Because of the influence of their historical kingdom, there is a peculiar character and distinction of the demand for a separate state by the Koch Rajbanshis and also by other ethnic communities of India. Most of the ethnic groups of India who are demanding separate state for their communities are using ethnic names for their proposed state. For example, Bodos of Assam are demanding Bodoland, Gorkha's of West Bengal are demanding Gorkhaland to protect and preserved their distinct identity. But in the case of Koch Rajbanshis, they are not using an ethnic name for their proposed separate state (Das, 2009). Koch Rajbanshis are demanding 'Kamatapur' as a separate state which is rooted in the historical memory of their erstwhile Kamatapur Kingdom.

The Koch Kingdom ruled in Kamatapur and it is said that Sandhya Rai established the Kingdom of Kamata in the 13th century including few portions of North Bengal and West Assam of present Northeast India. The kingdom of Kamata was ruled by different rulers of different dynasties from the period of the mid-13th century to the end of the 15th century (Das, 2009: 38-39). According to D. Nath the period beginning from A.D. 1200 to 1500, the Koches might have maintained their existence with a certain amount of political influence and continued to be so until Biswa Singha firmly established their hegemony in the western Brahmaputra valley in the first quarter of the 16th century (Nath, 1989: 15-16). Though the Koch Kingdom was there from the 13th century onwards it was only in the 16th century that the Koches emerged as a strong and influential kingdom established by the Koch Chieftain Bishwa Singha and

ruled the kingdom of Kamata from 1515-1540 (Das, 2009). After the death of Bishwa Singha, many other Koch Kings ruled the Kamatapur region till the treaty of April 5, 1773, signed between King Dharmendra Narayan and East India Company. Through this treaty Koch Kamata alias Koch Bihar became a native state of British India and continued till 1947. In West Bengal District Gazetteers Durgadas Majumder writes that until 28th August 1949 Koch Bihar was an Indian State ruled by Maharaja under British Government. By a document on 28th August 1949, Maharaja Jagaddipendra Narayan gave up his territory to the Government of India. By an order under section 290A of the Government of India Act 1935, Koch Bihar was included and merged with the Indian state of West Bengal on 1st January 1950. Since then, it is being administered as a district of West Bengal (Das, 2009: 56; Nath, 1989; Nag, 2010; Choudhury, 1991, 2011). Thus, Koch or Kamatapur kingdom lost its identity and disappeared in the post-independent state formation in India.

It is said that the merger of Koch Kamata alias Koch Behar as a district in the state of West Bengal gave rise to the identity consciousness among the Koch Rajbanshis (Rai, 2002). Some scholars argued that the beginning of the feeling of Rajbanshi's nationalism and Rajbanshi's identity had been seen when the prominent Rajbanshi Kshatriya leader Thakur Panchanan Burma argued in favour of Rajbanshi language in the third general meeting of 'Uttar Banga Sahitya Parishad' held at Rangpur now Bangladesh in 1910 (Ray, 2007: 115). Uttar Khanda Dal (UKD) an organisation was born in 1969, demanding a separate state for Rajbanshis namely as Kamtapur or Uttar Khanda. 'Uttar Banga Sanskritik Parishad' another organisation formed in the same year also raised the demand for recognition of Kamta language and its development. Demanding a separate Kamata state, a similar organisation named Kamta Rajya Sangram Parishad (KRSP) was formed in the Goalpara district of Assam in 1969. For the same purpose in 1987, UKD changed its name to Kamtapur Gana Parishad and in 1996 to Kamtapur Peoples Party (KPP) (Ray, 2007: 116). Kamatapur Liberation Organisation (KLO), a militant organisation came into being on 28th December 1995. All Koch Rajbanshi Students Union (AKRSU) and Koch Rajbanshi Sanmilani are the two Assam based organisation fighting for separate Kamatapur state and Schedule Tribe status for the Koch Rajbanshis living in Assam. Their proposed Kamatapur state comprises of eleven districts of Assam and five districts of North Bengal.[1] Some

other socio-political organisations that have given further momentum to the demand of separate Kamatapur state and Koch Rajbanshis identity assertion movement are Kamatapuri Peoples Party, Greater Cooch Behar Democratic Front, Kamtapuri Progressive Party, Greater Kamatapur Peoples Forum, etc. Thus, it is evident that the recent identity movement by the Koch Rajbanshis draws its inspiration from the historical memory of their erstwhile Kamatapur or Koch Kingdom.

Ethnic Identity Crisis

In the course of the study, it was found that the ethnic identity crisis of the Koch Rajbanshis has emerged as the most important factor responsible for the Kamatapur movement. As an ethnic community, Koch Rajbanshis have their own distinct culture, language, and identity but due to several causes like domination of the dominant groups, impact of modern civilization, indifference of the government policies, etc, they are in a state of losing their distinctiveness. The Koch Rajbanshis believed that they were victims of cultural differences and domination by the dominant groups as the dominant groups always tried to maintain their socio-political hierarchy ignoring the Koch Rajbanshis. In this regard, some of the respondents who belonged to the Students' Organisation have acknowledged the hegemonic nature of Bodo Tribe on the socio-economic and politico-cultural sphere of the life of Koch Rajbanshis. They demanded that the four districts comprising which the present Bodoland Territorial Council (BTC) is constituted, historically these territorial areas were under the Koch Kingdom and today the Bodos are trying to create their own history repressing the identity of the Koch Rajbanshis.[2] It is important to emphasise that many respondents felt that all the Tribals and non-tribals groups living in the Koch Rajbanshi dominated areas have supported the demand of Kamatapur accept the Bodo community. The Bodos even do not support their demand for scheduling their community (as Schedule Tribe) and that is why from time to time when the Koch Rajbanshi agitates in support of their demand, most of the leaders from the Bodo community counter agitate against it. As far the Koch Rajbanshis cultural organizations are concerned, they are of the view that the Bodos opposed their demand of ST status because they think that if the Koch Rajbanshis are included in Schedule Tribe category than it will be a challenge for the Bodos in getting job opportunities on the basis of reservation and many other kinds of challenges.

Lack of government policies to

protect the socio-economic and politico-cultural identity of the Koch Rajbanshis has emerged to be a major concern. Yet, the state government has not taken any policy to ensure the socio-economic development and protection of language and culture of the Koch Rajbanshis. Over the years the state government has totally failed to take appropriate development measures for the Koch Rajbanshis leading to lots of serious problems among them.

Although a small number of respondents (3 percent) felt about the impact of modern civilization as a factor of their identity crisis but this is an important point that they have raised. To achieve and fulfil the basic economic requirement of life, the Globalization, cultural hybridization and cultural fusion are pushing the smaller ethnic groups to accept it (Kraidy, 2005) but at the same time, it has created a consciousness and fear of losing their traditional cultural values, language and identity. Therefore, they have started to rethink and re-establish their traditional cultural values and identity.

It is observed that the middle-class Koch Rajbanshis is more aware as regard to their identity consciousness compared to that of common masses. It is also observed that most of the leaders who are leading the socio-political organizations and agitating for the Koch Rajbanshis identity issue are from middle-class Koch Rajbanshi. They are trying to mobilize the common masses by creating awareness among them. They think that a separate state alone will protect their distinctiveness. In fact, most of their civic organizations are born with a view to safeguarding their distinctiveness.

Poverty, Land Alienation and Illiteracy

It is observed that the poor common masses supported the demand of separate Kamatapur state with a hope to develop their economic condition as most of the respondents were living under below poverty line. No policy measure has been taken by the government to uplift their economic conditions. Agriculture is their prime income source for most of the Koch Rajbanshis. During the last decade, many times draught and flood badly affected them and hampered their livelihood. Although, from the last many decades they are agitating for constitutional reservation of their community, yet there are no such positive responses from the side of the government. Therefore, many of the respondents were of the view that if they get some amount of territorial autonomy for self-rule, they will at least able to achieve some degree of development of their community. Some of them gave the reference of BTC (Bodoland Territorial

Council)[3] where the Bodo community is doing well after getting territorial autonomy. It is also observed that some of the respondents were very much reactive in responding that they want Kamatapur because it is their identity, their historical kingdom, and they have the right to get it. Whereas, the majority of the respondents opined that Kamatapur as a separate state is required not only because it is their historical right but it is required for them to achieve development, to protect their distinct identity.

Besides poverty, land alienation, illiteracy and unemployment are some of the other factors responsible for the Koch Rajbanshis identity movement. In the early part of the 90s, land alienation emerged as a major problem among the Koch Rajbanshis in North Bengal mainly due to migration of the upper caste Hindu Bengalis from the other parts of West Bengal as well as immigration from Bangladesh to the Koch Rajbanshis inhabited areas. This was a major cause that created a sense of alienation among them and compelled them to think for the preservation of their distinctiveness. N. R. Ray wrote "influx of migrants into the Koch Rajbansis dominated areas of North Bengal was a continuous process and their number was so great that they became a major factor of political 'Vote Bank' and they were utilised to the fullest. The Koch Rajbanshis were mutually benefited too, but it created a lot of pressure on the aboriginal agriculturalist Rajbanshis (Ray, 2007: 98). In the case of Assam, this problem emerged after the 1980s as a major challenge due to illegal infiltration from Bangladesh to the lower parts of Assam where most of the areas are Koch Rajbanshi dominated. Therefore, it is evident that in the anti-immigration movement of Assam the contribution of the Koch Rajbanshis is much more prominent.

Relative Deprivation

Relative deprivation as a concept can be defined as a judgement that one or one's ingroup is disadvantaged compared to a relevant referent. This judgement invokes feelings of anger, resentment, and entitlement (Pettigrew, 2015). In the case of Koch Rajbanshis, relative deprivation is an important factor responsible for their identity movement. This factor makes them feel deprived of socio-economic opportunities from the government compared to other ethnic groups in their inhabited areas. In this regard, they mainly compare themselves with the Bodo Tribe. Like Koch Rajbanshi, Bodo is also an ethnic group (plain tribal) of Assam. Through the socio-political movement, the Bodo community of Assam is able to

avail of many benefits from the state as well as the central government. Their socio-political movement is stronger as compared to Koch Rajbanshis. After a long fight, the Bodo language got constitutional recognition in the year 2003 and was included in Eight Schedule of the Constitution of India. Following the year 2003, they again got Bodoland Territorial Council (BTC) under which they got some amount of autonomy for self-rule and opportunities for socio-economic and cultural development. Like Bodos, though the Koch Rajbanshi's autonomy agitation for socio-economic development is a long-drawn battle but they get nothing as compared to Bodos.[4] This feeling of deprivation is an important reason which has fuelled the Kamatapur movement in Assam in recent times.

Government Response to the Demands of Koch Rajbanshis

The identity movements by the Koch Rajbanshis have a long history. The movement for a separate Kamatapur state is also not a recent one. The autonomy movement by the Koch Rajbanshis and the idea for a separate homeland is almost seventy years old and the aspiration for socio-cultural recognition is around hundred years old. Scholars argued that the caste movement of the early 20th century which is also known as the 'Kshatriya Movement' by the Koch Rajbanshis under the leadership of Panchanan Burma was also part of the Koch Rajbanshi's identity movement ((Das, 2009; Basu, 2003; Debnath, 2007). But the responses of the government are very much negative to the demands made by the Koch Rajbanshis to address the issues of their identity. 96 per cent of the respondents opined that the response of the government was negative while only a small number of the respondents (4 percent) opined that the response of the government was partially positive.

The charter of demands by the Koch Rajbanshi to the government of India includes 100s of demands. Among them the demand of granting Scheduled Tribes status; demand for separate Kamatapur state with immediate effect as per the merger and agreement signed between the Koch Rajbanshi king, His Highness Sir Maharaja of Cooch Behar and Government of India on 28th August 1949; recognition of Rajbanshi language under the 8th Schedule of the Constitution of India; handing over of the education system to Don Bosco Education Society; demand for modification of the land policy for safeguarding cultural heritage of Koch Rajbanshi community; demand to the government of India to institute the IMA

Best Cadet Award in the name of Koch Rajbanshi General Cilaray of Kamatapur Kingdom; demand for the installation of a Bronze Statue of Bir Chilarai in front of the Parliament House, New Delhi; demand for raising Koch Rajbanshi Regiment in Indian Army, Navy, Air-force, BSF, Para Military Force, CRPF and other defence forces, etc to name a few.[5] Though the Koch Rajbanshis are demanding the above demands with immediate effect the Government response has been lukewarm. Even their very demand for ST status is not fulfilling which they are demanding since 1966. Actually, the political parties of Assam are playing politics on the ST demand by the Koch Rajbanshis.

Future of Koch Rajbanshis Identity Movement

As regards the future of Koch Rajbanshi's autonomy movement it may be said that the movement will continue until the basic problems of the Koch Rajbanshis are addressed. In the course of the present study, it was found that there are no such changes in the nature of the Kamatapur movement over time. From the very beginning, most of the socio-political, as well as cultural organisations that are leading the movement, has been following the path of nonviolent democratic protest movement in support of their demand. Roadblock, hunger strike, sending memorandum to the Government, calling Assam bandh, etc are some way of demonstration they have been following. The leaders of the movement have generally failed to mobilize the common masses. One of the striking facts of the matter is that the Koch Rajbanshis of Assam does not have a political party of their own. Therefore, at the time of election, they either support regional parties such as Bodoland Peoples Front (BPF), Assam Gana Parishad (AGP) or national parties such as Indian National Congress (INC), Bharatiya Janata Party (BJP). At the time of election though these parties promise to fulfill the aspirations of the Koch Rajbanshis but after the election, the parties turn deaf ears to the problems of Rajbanshis. Therefore, in the near future, there is a possibility of forming a political party by the leaders of Koch Rajbanshi's socio-cultural organisations who are leading today's identity movement. There is also the chance of searching for solutions to Koch Rajbanshi's problems in development and good governance instead of mobilizing identity on the basis of their culture and language by these community leaders.

Conclusion

Koch Rajbanshi's identity movement is a long-drawn battle

to preserve, protect and develop their distinct identity. Although the genesis of Koch Rajbanshis autonomy movement was in the colonial period, from the last few decades particularly from the 1980s it is observed that the identity consciousness among the Koch Rajbanshis is increasing and they are trying to find a way out to develop, maintain, and protect their socio-economic and politico-cultural identity. In many ways, the autonomy movement by them is the outcome of the socio-political and economic marginalization. Koch Rajbanshis who once upon a time, ruled over large parts of Northeast India, suffered economic hardship and political marginalization in the early part of the 20th century due to the attack from Bhutias; and to get rid of this they came under British India as a native state. After the merger of their princely state 'Cooch Behar' with the Indian state of West Bengal they systematically became victims of socio-cultural and economic marginalization that had created a feeling of alienation, deprivation, and fear of losing their distinct identity. Today, they are confronted by problems ranging from ethnic identity crisis, economic underdevelopment, land alienation, illiteracy, unemployment, etc. To maintain national integrity, political stability, and socio-economic development in the north-eastern region of India, it is an urgent need and responsibility of the Indian state to address the multilayered problems that the Koch Rajbanshis are confronted today.

Acknowledgements

I would like to thank to my supervisor, Bidhan Golay for his intellectual inspiration, unwavering support, encouragement and friendliness during this work.

Endnotes

[1]For details refer to proposed map of Kamatapur state at http://www.kamatapur.com/, Accessed on January 29-2016.

[2]In conversation with the members of All Koch Rajbanshi Students Union (AKRSU), on August 2015 at Bongaigaon and Guwahati, Assam.

[3]Officially it is called as Bodoland Territorial Area District, is an autonomous region in the state of Assam, India, formed in 2003 comprising four districts namely, Kokrajhar, Baksa, Udalguri, and Chirang.

[4]Personal conversation with the members of Kamtapur Peoples Party (KPP) and All Koch Rajbanshi Students Union (AKRSU), on August 2015 at Bongaigaon and Guwahati, Assam.

[5]Memorandum submitted to Dr. Manmohan Singh, Prime Minister of India through the Chief Minister of Assam on 23.01.2004 by the All Koch-Rajbonshi Students' Union (AKRSU) and memorandum submitted to the Prime Minister of India, Indrakumar Gujral, through the divisional commissioner of North Bengal, Jalpaiguri division on 26.09.1997 by the Kamtapur Peoples' Party (KPP). Collected from All Koch-Rajbanshi Students' Union (AKRSU), Head Office- Bongaigaon, Assam, Pin- 783380.

References

Basu, S. (2003). *Dynamics of a Caste Movement: The Rajbanshis of North Bengal.* New Delhi: Manohar.

Choudhury, A. C. (1991). *The Koches Around the World.* Bongaigaon: Ratnapeeth Prokashan.

Choudhury, A.C. (2011). *Koch Rajbanshi Jatir Itihas Aaru Sanskriti (History and Culture of Koch Rajbanshi Peoples).* Bongaigaon: Unique Printers (in Assamese).

Das, A. J. (2009). *Kamatapur and Koch Rajbanshi Imagination.* Guwahati: Arunima Deka Publication.

Debnath, S. (Ed) (2007). *Social and Political Tension in North Bengal (Since 1947).* Siliguri: N. L. Publishers.

Hussain, M. (1993). *The Assam Movement: Class, Ideology.* New Delhi: Manak Publication.

Hussain, M. (2005). *Coming Out of Violence: Essays on Ethnicity, Conflict Resolution and Peace Process in North-East India.* New Delhi: Regency Publications.

Kumar, B. B. (Ed.). (2007). *Problems of Ethnicity in the North-East India.* New Delhi: Concept Publishing Company.

Kraidy, M. M. (2005), *Hybridity, or the Cultural Logic of Globalization,* Philadelphia: Temple University Press.

Nath, D. (1989). *History of Koch Kingdom.* New Delhi: Mittal Publication.

Nag, H. (2010). *Kamatapur Thakey Coochbehar (From kamatapur to Cooch Behar).* Coochbehar: Mittra and Gosh Publication (in Bengali).

Pettigrew, T. F. (2015), Samuel Stouffer and Relative Deprivation, *Social Psychology Quarterly,* Vol. 78 (1) 7-24.

Ray, N. R. (2007). *Koch Rajbanshi and Kamatapur:* The Truth Unveiled. Guwahati: Vicky publication.

Rai, B. (2002). *Sukiya Kamatapur Rajya Kiyo (Why Separate Kamatapur).* A booklet published by All Koch Rajbanshi Students' Union (AKRSU), April 25 (in Assamese).

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Evaluating the Role of Green Technology Adoption and its Impact on Human Rights of the Brick Kilns Workers of Gouripur Area under Dhubri District, Assam

Prince Zakir Abdullah[1*]

Accepted : 20 June, 2026

Abstract

The Brick kiln industry is one of the hazardous informal industries in South Asia with its unsafe work place, bondage labour, child labour and serious environmental pollution. Traditional fixed chimney kilns (FCK) dominate the brick kiln industry in the district of Dhubri in Assam which creates a major threat to the health and human rights of workers involved in this industry. Green technologies like zig-zag kilns, vertical shaft brick kilns (VSBAK) and hybrid Hoff man kilns (HHSK) are now being promoted to minimize pollution and improve labour standards in the brick kiln industry. The purpose of this research was to assess how the use of green technology impacts human rights in the brick kilns in Dhubri using

*Correspondence :
Email: prince.abdullah00@gmail.com

[1]Department of Political Science
Chilarai College, Golakganj, Assam-783334

Published offline : 7 August

surveying, interviewing and observation methods. This research found that there has been a substantial improvement in the areas of health, safety, wages and reduction in child labour since the introduction of green technologies in brick kilns in Dhubri; however, barriers to the adoption of these new technologies continue.

Keywords Green technology; Brick Kilns; Human rights; Dhubri; Labour rights

Introduction

India has over 10 million workers employed in the Brick kiln industry with large numbers of migrant workers and casual labourers (Human Rights Watch, 2018). Brick kilns in the state of Assam, specifically in the District of Dhubri, employ a significant number of disadvantaged groups who migrate to work in the brick kilns during the seasonal operations. Due to the prevalence of the use of traditional fixed chimney kilns, there is an increased emission of pollutants, as well as a hazardous environment for workers (Centre for Science and Environment [CSE], 2016).

Promoting green technologies through national environmental policy and international climate agreements may provide new alternatives that can contribute to positive environmental and human rights impacts (Maithel et al., 2019). However, few empirical studies have evaluated the benefits of these technologies on labour welfare.

Green Technology Brick Klin

The Green Technology for Brick Kilns is the application of clean, eco-friendly, efficient and cost-effective brick-making technology to minimize or eliminate pollution and promote better worker health conditions. Traditionally, a large number of brick kilns consume large quantities of coal and emit hazardous pollutants including particulate matter and black carbon which contribute to air pollution and respiratory diseases among brick kiln workers. The Zig-Zag Kiln has been developed with improved airflow and combustion efficiencies than traditional kilns and therefore it is able to utilize 20 percent less coal per unit while significantly decreasing emissions (Down To Earth, 2017). The VSBK (Vertical Shaft Brick Kiln) has even greater efficiencies than the zig-zag kiln; it reduces the amount of fuel required for firing a kiln by between 30 – 50 percent and shortens firing cycles when compared to traditional kilns (Mongabay India, 2024). The use of fly ash bricks will also assist in the conservation of top soil while reducing the overall environmental

impacts associated with making bricks (Press Institute of India, 2023). Although the green technologies have significant environmental and health advantages, they are still not being adopted at a rapid pace in many areas of Assam due to the high capital costs associated with converting brick kilns into green brick kilns, low levels of public awareness and a lack of technical assistance. Policy incentives and capacity building efforts may be used to speed the transition to greener and cleaner brick-making processes.

Meaning of Human Right

The rights and freedoms belonging to each and every human being as a result of their humanity, are referred to as "human rights". The rights and freedoms that make up human rights, are applicable to all individuals, and include all aspects of life such as; civil rights, political rights, economic rights, social rights, and cultural rights. Examples of these types of rights include; the right to life, the right to be treated equally, the right to express oneself freely, the right to an education, the right to good health care, and the right to employment. Human rights are based on the belief that all humans have inherent dignity and value, and thus are entitled to protection under international law. According to the United Nations, human rights are "the rights that are inherent to all human beings...regardless of race, color, sex, language, religion, political or other opinion, national or social origin, property, birth or other status" (United Nations, 1948).

Research Problem

There are many documented environmental and societal consequences for the failure to adopt green technology in the production process at brick kilns. However, despite this, there has been little systematic empirical study of whether the adoption of green technology by brick kilns impacts upon the human rights of workers in Assam, particularly in Dhubri District's Gouripur. Is green technology being adopted? Does the use of green technology improve the working conditions of workers? What barriers exist that prevent greater levels of adoption? In order to address these gaps, policy and interventions will be unable to meet the dual objectives of promoting both sustainable practices and protecting human rights.

Research Objectives

1. To understand the current extent and kinds of green technology being used in brick kilns in Gouripur, Dhubri, such as zig-zag kilns and fly-ash bricks.
2. To evaluate the working and

living conditions of brick kiln workers in the area, focusing on aspects like health, safety, income, and their rights.

3. The study will explore how the use of green technology is linked to improvements in the human rights of workers.
4. To suggest policy recommendations and practical strategies to support the adoption of green technologies in a way that respects and promotes workers' rights.

Research Questions

1. What percentage of brick kilns in Gouripur have implemented green technologies, and in what ways are these technologies being used?
2. What are the main human rights challenges that brick kiln workers encounter in Gouripur?
3. Do brick kilns that employ green technology offer improved working conditions, including health, safety, and wages, compared to those that use traditional methods?

Literature Review

The Brick Kiln Industry Construction within South Asia relies heavily on the brick kiln industry - India, Nepal, Bangladesh and Pakistan. Within India alone, the brick kiln industry is one of the largest producers of burnt-clay bricks and is very labour intensive; studies, for example, Bhattacharya (2018), indicate that over 150,000 kilns are operating throughout the country employing millions of migrant and seasonal workers. In general, the brick kiln industry has poor informal labour relations, inadequate regulations and significant human rights issues. Assam, especially districts such as Dhubri, exhibit many of the same characteristics as other areas with small to medium sized kilns primarily utilizing traditional fixed chimney kilns (FCKs). Research has documented that many violations of human rights are occurring in traditional brick kilns. Researchers, such as Sarkar (2019), and Pritchard (2021), have identified several examples of exploitation among these workers. Examples include long work hours, debt bondage, the failure to pay wages, the employment of children, and substandard living accommodations with no ventilation and extreme heat for workers who reside at or near kiln sites.

Green technologies have a number

of environmental benefits; for example, according to Aggarwal & Maithel (2017) green technologies produce less SPM and greenhouse gases than FCKs and the Zig-Zag kiln produces much less than the traditional FCK.

Research Gap

Despite increasing research on the environmental benefits of green technologies, very few studies specifically examine their impact on human rights and labour conditions. The existing body of literature in Assam, and especially in Dhubri district, remains limited. There is a lack of empirical data comparing traditional kilns with green-technology kilns regarding wages, health outcomes, safety standards, child labour, and the overall dignity of workers.

This gap highlights the need for the current study, which goes beyond environmental sustainability to focus on improving human rights through the adoption of green technologies.

Methodology

The researcher has used both primary and secondary data for his research. Sampling Technique: The researcher took multy stage sampling for his study. The researcher took the nearby brick kilns of Gouripur as Gouripur is one of the main brick-kiln clusters in Dhubri district, with an estimated 20–25 operational kilns out of 147 in the district (PCBA, TARA 2022). There are Green-technology kilns (e.g., zig-zag kilns, improved combustion kilns) and Traditional kilns (Fixed Chimney Bull's Trench Kilns – FCBTKs).

A total sample of 5 kilns were taken for the study out of 1 were traditional kilns and 4 were green technology kilns which ensures diversity, feasibility, and comparative analysis. The researcher visited the brick fields in the month of November 2025. The name of the brick kilns are ABCD, Dumardaha, ABI Dumardaha ptII, MBF, Geramari ptII, ACB, Gouripur road, Moon Brick field,Alomganj for his study. By stratified random sampling the researcher has took total 50 workers which are given below. The workers include fireman, brick moulders, loaders, women workers etc.

Sample workers: 5 Kilns X 10 workers = 50

Brick Kiln manager: 5 Kilns X 1manager = 5

Government Officials = 5

.....

Total respondents : 60

The researcher has conducted both quantitative and qualitative research for his study. The researcher has constructed structured questionnaire and conducted interviews.

Result and Analysis

Quantitative Analysis of Data

Table 1: Demographic Profile of Brick Klin Workers (N=50)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	36	72%
Gender	Female	14	28%
Age Group	18-30 years	20	40%
Age Group	31-45 years	23	46%
Age Group	46+ years	7	14%
Worker Type	Fireman	10	20%
Worker Type	Clay Moulder	18	36%
Worker Type	Loader/Carrier	14	28%
Worker Type	Women Worker	8	16%

Source : Field survey, November, 2025

Out of fifty worker participants there were a higher number of men (36) than women (14). The majority of workers fell into the 31-45 years-old category (23); this age range is generally known as the "economically active" workforce. Of all the occupations listed on the survey, clay moulders represented the greatest number of participants (18), while loaders (14) and firemen (10) were second and third respectively; the fact that there were eight female participants also supports evidence of a gender-based pattern regarding who performs brick molding and carrying duties.

Table 2 : Working Conditions in Traditional Vs Green Technology Kilns

Indicator	Traditional Kilns (n=30)	Green-Tech Kilns (n=20)
Provision of PPE*	4 (14%)	12(60%)
Access to safe drinking water	6 (20%)	14 (70%)
Access to clean toilets	3 (10%)	11 (55%)
Average daily working hours	10-12 hrs	8-10 hrs

Source : Authors' calculation

*Note : *PPE = Personal Protective Equipment, which includes any equipment designed to protect workers from workplace hazards. (Masks, Gloves, Boots, Mask, Goggles etc)*

Analysing the indicators the researcher found that 60% of respondents uses PPE in Green-Tech Kilns which indicates green technology adoption significantly improves worker safety, reflecting regulatory compliance and better management practices. Like that regarding access to safe drinking water, access to clean toilets, green tech kilns workers are 70% and 55% respectively and the daily working hours of the green tech kiln workers are lesser than traditional kilns worker. These differences highlight the positive spillover effects of improved kiln design on human rights and workplace dignity.

Table 3 : Wage Structure

Category	Traditional Kilns (n=30)	Green-Tech Kilns (n=20)
Wage deduction complaints	10 workers (33%)	2 workers (10%)

Source : Field survey, November, 2025

Table 4 : Health Issues Reported by Workers

Health Issues	Traditional kilns(n=30)	%	Green-tech kilns (n=20)	%
Respiratory Problem	20 workers	67%	6 workers	30%
Eye irritation	16 workers	53%	5 workers	25%
Chronic Fatigue	18 workers	60%	8 workers	40%
Skin irritation	9 workers	30%	4 workers	20%

Source : Field Survey, November, 2025

From the table it is clearly shows that percentage of health issue in traditional brick kilns are always higher than the green technology adopted brick kilns.

Table 5: Human Rights Awareness Indicators

Human Rights indicators	Traditional kilns (n=30)	Green-Tech kilns (n=20)
Awareness of labour rights	7 workers (23%)	9 workers (45%)
Freedom to raise complaints	5 workers (17%)	8 workers (40%)
Access to healthcare support	3 workers (10%)	7 workers (35%)

Source : Field survey, November, 2025

In the table 5 the indicators show that green-tech kilns are twice as likely to respect and protect workers' human rights.

Qualitative Analysis of Data

Qualitative analysis was drawn from interviews with 5 managers,5 government officials and 20 selected workers (in-depth interviews).

A worker stated that "their work pressure has remained the same however; their working environment has greatly improved". The manager's view was that the introduction of 'green' technology will continue to reduce the amount of coal used as well as improve the quality of bricks produced which in turn should lead to greater compliance with labour standards. The government official indicated there were less complaint from the local population regarding environmental issues; therefore, the government views the use of "green" technology as being aligned to the objective of environmental policies. Both kiln types still face challenges like lack of formal contracts, Limited social security and migrant workers still vulnerable in the brick kilns. When interviewed to the managers of these brick kilns they mostly mentioned three barriers of adopting green technology i.e., high initial investment, lack of technical knowledge and limited financial support from government. Officials highlighted their views as need for stricter enforcement, need for incentives for adoption of green technology and Importance of linking labour welfare to environmental reforms.

Conclusion

The objective of this research was to determine if there exists an association between the use of green technology and the human rights conditions of brick kiln labourers in the Gouripur area of Dhubri district, assam with both qualitative and quantitative methodologies employed. Results clearly indicated that brick kilns employing green technologies, particularly zig-zag kilns and improved

firing systems, provide much superior working conditions, health outcomes and respect for worker's rights than do brick kilns employing traditional fixed chimney bull's trench kilns (FCBTKS).

Quantitatively, data demonstrated that brick kiln labourers utilizing green technologies were significantly more likely to utilize personal protective equipment (PPE), safe drinking water, sanitation facilities and wage transparency than those in brick kilns utilizing traditional FCBTKS; additionally, brick kiln labourers utilizing green technologies reported fewer incidences of respiratory illnesses, eye irritation, and chronic fatigue which are conditions directly related to exposure to high levels of smoke and pollutants in traditional kilns.

Qualitatively, data portraits that brick kiln labourers utilizing green kilns described improved workplace dignity, ability to raise complaints, and more structured management practices; additionally, managers acknowledged environmental and economic benefits associated with green technology, and government officials recognized green technology as necessary to achieve policy compliance; however, persistent human rights concerns including lack of written contracts, absence of social security benefits, gender-based wage inequalities and vulnerabilities of migrant labourers remained common across kiln types.

In conclusion, the research indicated that Green Technology functions as a catalyst for improving Human Rights, however, Technological Advancements alone will not achieve meaningful or lasting change, and therefore, Green Technology must be accompanied by strong Regulation, worker protections, and institutional support.

Policy Recommendations

Based on the study's findings, the following policy recommendations are proposed to enhance human rights, promote green technology adoption, and improve governance within the brick kiln sector:

1. Financial Incentives for Green Technology Adoption- Introduce subsidies, tax rebates, and low-interest credit to support kiln owners in converting to green technologies.
2. Mandatory Labour Standards- Enforce mandatory provision of PPE, sanitation, safe drinking water, and first aid facilities.
3. Healthcare Interventions- Establish mobile health camps to conduct quarterly check-ups for brick kiln workers and provide mandatory health cards for migrant workers.
4. Recommendations for Labour

Departments and NGOs- Conduct awareness programs on labour laws, human rights, and occupational safety.

5. Rehabilitation of Vulnerable Workers- Identify and assist child labourers (if any), trafficked workers, and unregistered migrant labourers. Offer counselling, legal support, and reintegration programs.

Overall, Policy Implication: The findings suggest that a combined strategy involving technological modernization, regulatory enforcement, and worker-centered welfare measures can significantly improve the human rights landscape of brick kilns in Assam. Adoption of green technology is not only environmentally beneficial but also socially transformative. With appropriate government support and structured labour protections, the Gouripur area can become a model for sustainable and humane brick production in the region.

Overall, Policy Implication: The findings suggest that a combined strategy involving technological modernization, regulatory enforcement, and worker-centered welfare measures can significantly improve the human rights landscape of brick kilns in Assam. Adoption of green technology is not only environmentally beneficial but also socially transformative. With appropriate government support and structured labour protections, the Gouripur area can become a model for sustainable and humane brick production in the region.

References

Agarwal, R., & Chakraborty, D. (2019). *Environmental performance of zig-zag brick kilns in India.* Journal of Cleaner Production, 223, 65–75. https://doi.org/10.1016/j.jclepro.2019.03.121

Aggarwal, R., & Maithel, S. (2017). Cleaner brick production technologies: *Zig-zag kilns and their environmental performance in India.* Greentech Knowledge Foundation.

Bhattacharya, R. (2018). *Labour migration and working conditions in India's brick kiln industry.* International Labour Organization. https://www.ilo.org

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3(2),* 77–101. https://doi.org/10.1191/1478088706qp063oa

Brick Kiln Owners' Association of India. (2020). *Status report on brick kiln technology and emissions in India.* New Delhi: Author.

Centre for Science and Environment. (2021). *Adoption of clean technologies in the brick*

manufacturing sector in India. New Delhi: CSE.

Government of Assam, Labour Commissionerate. (2020). *Annual report on labour welfare and occupational safety in Assam*. Guwahati: Government Press.

International Labour Organization. (2018). *Capturing the lives of brick kiln workers in South Asia*. Geneva: ILO.

International Labour Organization. (2020). *Labour and human rights conditions in informal sectors*. Geneva: ILO.

Pritchard, M. (2021). Bonded labour and socio-economic vulnerability among brick kiln workers in South Asia. *International Journal of Human Rights, 25(7)*, 1123–1141. https://doi.org/10.1080/13642987.2020.1845123

Pollution Control Board, Assam. (2022). *List of registered brick kilns in Dhubri District* (TARA Report 2022). Guwahati: PCBA.

Sarkar, S. (2019). Human rights violations and labour exploitation in traditional brick kilns in India. *Journal of South Asian Development, 14(3)*, 345–362. https://doi.org/10.1177/0973174119885601

Sharma, S., & Maithel, S. (2018). *Brick kiln performance, energy use and environmental impacts*. New Delhi: Greentech Knowledge Foundation.

Singh, G., & Chandel, S. S. (2020). Occupational health hazards among brick kiln workers: A case study from northern India. *International Journal of Occupational Safety and Health,* 10(1), 24–32. https://doi.org/10.3126/ijosh.v10i1.33100

UN Human Rights Council. (2011). *Guiding principles on business and human rights*. Geneva: United Nations.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Myth of Vena and Pṛthu in the Purāṇas-the Myth Behind the Creation of Agriculture

Purboshri Borpuzari[1*]

Accepted : 11 June, 2026

Abstract

The word *ākhyāna* (myth) is used to denote myth, which literally means a traditional story, which embodies a belief regarding some factor or phenomenon of experience, and in which often the forces of nature and of the soul are personified. The Myths are the stories which were handed down from olden times. They are the stories with a veiled meaning. They were originated in ancient times. In the Purāṇas we come across various myths. Among them the myth of Vena and Pṛthu is a significant myth. It let us to know about the creation of agriculture. Variations appear regarding this account. According to the Purāṇas, the earth swallowed the medicinal herbs, the sacred grass, which was used at sacrifices and holy rituals because the kings disrespected her. Then Pṛthu got angry and wanted to punish Earth. But the Earth agreed to be milked and by this way corn was produced.

*Correspondence :
Email: purboshri.borpuzari@gmail.com

[1]Department of Sanskrit
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

Keywords Myth; Purāṇic; Creation; Agriculture

Introduction

The Purāṇas are an unfailing source of information that helps us to reconstruct the history of Indian culture and civilization. The Purāṇas are the old narratives or ancient legends having didactic contents. Yāska in his *Nirukta* (Nir.) defines Purāṇa as –*purā navaṁ bhavati* [1] i.e. it was new in the days of yore. The etymology of the term *Purāṇa* is furnished by the *Vāyu Purāṇa* (Vā.P.) as- *yasmāt purā hi anati idaṁ purāṇaṁ tena tat smṛtam* [2] i.e. that which lives from very remote times. The *Bhāgavata Purāṇa* (Bhā.P.) mentions the ten characteristics of the Purāṇas as described by the seers in conformity to Vedas and Śāstras.[3] But the *Matsya Purāṇa* (M.P.) and the *Vāyu Purāṇa* speak of only five characteristics.[4] They are creation, dissolution and re-creation, the lineage line, Manvantaras and the description of the genealogical tables-*sargaśca pratisargaśca vaṁśo manvantarāni ca/vaṁśyānucaritaṁ caiva purāṇaṁ pañcalakṣaṇam//*.The Purāṇas, with these five characteristics , sing the glory of Brahmā, Viṣṇu, Arka and Rudra, as well as they also describe the creation and dissolution of the Earth.[5] The Purāṇas have their roots in the Vedic literature. They are thus composed with a view to get the knowledge revealed in the Vedas through stories.[6]

The word ākhyāna is used to denote myth, which literally means a traditional story, which embodies a belief regarding some factor or phenomenon of experience, and in which often the forces of nature and of the soul are personified. It can also be defined as a sacred narrative regarding a god, a hero, the origin of the world or of a people, etc.[7] The word ākhyāna is derived as- āṅ khyā lyuṭ /kathanam iti.[8] V.S. Apte in his *The Practical Sanskrit-English Dictionary* defines the word *ākhyāna* as "a tale, a story; especially a legendary story, legend". [9] M. Monier Williams in his *A Sanskrit-English Dictionary* too defines *ākhyāna* as "a tale, story, and legend". [10] The *Encyclopedia Britannica* defines the word myth as traditional story of ostensibly historical events that serves to unfold part of the worldview of a people or explain a practice, belief, or natural phenomenon. Myths relate the events, conditions and deeds of gods or superhuman beings that are outside ordinary human life and yet basic to it. These events are set in a time altogether different from historical time, often at the beginning of creation or at an early stage of prehistory.[11] According to *The*

Encyclopedia of Religion and Ethics a myth is usually, directly or indirectly, in narrative form; its difference from ordinary tales seems to lie partly in the fact that it is believed to be substantially true, at least by those among whom it is first repeated; it thus differs from a parable or allegory, as well as from a fiction or romance. Moreover, most myths, if not all, are etiological; this is to say, they grew up or were invented to explain certain phenomena, beliefs or customs. [12] Sukumari Bhattacharji in his *Literature in the Vedic Age* states that a myth is a statement of the state of affairs *in illo tempore,* i.e. something which happened at the beginning of time with cosmic or minor etiological creations subsumed under it. The concern and obligation of the socially responsible man is to preserve creation by re-enacting through prescribed sacraments that which the gods performed for creation and preservation.[13] The Myths are the stories which were handed down from olden times. They are the stories with a veiled meaning. They were originated in ancient times. In the Purāṇas we come across various myths. Among them the myth of Vena and Pṛthu is a significant myth. It let us to know about the creation of agriculture.

Objectives of the Study

This paper aims to discuss in details about the myth behind the creation of Agriculture as depicted in the Purāṇas.

Methodology of the Study

This paper has been presented in the following manners :

1. All the names of the books, both original and modern, mentioned in the paper are printed in italic type.
2. Original Sanskrit Texts used as references have been shown in Endnote at the end of the paper.
3. References of the works in the Endnotes are shown in the abbreviated forms except in a few cases.
4. The original Sanskrit words and Sanskrit quotations are italicized and presented in the transliterated form in English in the main body of the paper.

Discussion

The myth of Vena and Pṛthu is found in several Purāṇas.[14] Pṛthu is the name of a semi-mythical dignitary who is mentioned in the Atharvaveda(AV.) as the originator of agriculture-

tāṁ pṛthī vanyoḍhok tāṁ kṛṣiṁ ca sasyaṁ cādhok//

te kṛṣiṁ ca sasyaṁ ca manuṣyā upa jīvanti kṛṣṭarādhirupajīvanīyo bhavati ya evaṁ veda//[15]

The *Ṛgveda*(Ṛ.V.)[16], the *Jaiminīya Brāhmaṇa*(J.B.)[17], the *Śatapatha Brāhmaṇa*(Ś.B.)[18] too refers to Pṛthu as Vainya- the son of Vena. *The Brahma Purāṇa*(Br.P.) introduces Pṛthu as the protector and overlord of the earth. He was the oldest of Kṣatriyas. He was the first and foremost of those, whose coronations were performed with a Rājasūya sacrifice.19 In the commentary of the *Śatapatha Brāhmaṇa,* Sāyaṇācārya explains that Pṛthu appropriated all the food on earth. [20] Pṛthu was a king of great virtue who was born in the line of Dhruva. The Brāhmaṇas churned the right arm of Vena for the purpose of producing progeny. As a result , from the right arm of Vena, Pṛthu came out. Pṛthu milked the earth-cow. Variations appear regarding this account. According to the Purāṇas, the earth swallowed the medicinal herbs, the sacred grass, which was used at sacrifices and holy rituals because the kings disrespected her. Then Pṛthu got angry and wanted to punish Earth. But the Earth agreed to be milked and by this way corn was produced. According to the Brahma *Purāṇa,* Pṛthu, the tiger among men, milked the vegetable kingdom. Even today the subjects subsist on those food-grains and edibles.[21]

According to the *Viṣṇu Purāṇa* (Vi.P.), when the earth was without a king, all vegetable products had been withheld, and people were completely ruined. When the people were in distress, they approached king Pṛthu. Addressing him as the bestower of subsistence to them and the protector of them they told that during the interval between Vena's death and Pṛthu's assuming charge, the goddess Earth drew inside all the vegetations. So they were about to die suffering from hunger and prayed him to grant them vegetables which were the support of their lives.[22]

Hearing this, Pṛthu got angry and taking the primitive bow of Mahādeva named Ājagava and several arrows went in search of the goddess Earth. The Earth got frightened and taking the form of a cow she fled. She went to all lokas but Pṛthu followed her everywhere. At last willing to escape from the arrows of Pṛthu trembling with fear, Pṛthivī asked Pṛthu the king of men, whether he knew the sin of killing a female or not because he thus wanted to kill her. Pṛthu than replied that when the happiness of many is fixed by the destruction of one evil existence the death of the same is considered as an act of virtue.[23]

Then Pṛthivī asked that if for the welfare of his subjects, he ends her, then would the people obtain their support. [24] At her question Pṛthu replied that if he destroys her, he would support his

subjects by the strength of his dutiful performance.[25] Then the Earth being in a state of extreme apprehension expressed respect for the king and said that at his command she would restore all the vegetables in the form of milk, which was destroyed by her. She asked him the calf by which she would be able to produce milk by secretion. Moreover she requested him to make all the places level so that her milk i.e., the seed of all vegetation might flow everywhere.[26]

Pṛthu following her suggestions by the end of his bow Ājagava put in arrangement the thousands of mountains at one place which were lying scattered over the country. Before this time there was no cultivation, no pasture, no agriculture. The grounds were not even and so there were no divisions into villages and towns. It was since the time of Pṛthu that all these things came into being. As all vegetables got destroyed so people were procured with great difficulty. To get relief from such a situation having made Svāyambhuva Manu the calf , king Pṛthu milked the Earth and received the milk for the benefit of mankind.[27]

The *Matsya Purāṇa* [28] too reveals the secret why earth is called gau or cow, through the story of king Pṛthu and the milking of the cow. It identifies characteristically the calf, the milker, the milk and the vessel. According to this *Purāṇa,* when the Ṛṣis milked the earth through Bṛhaspati; their calf was Soma; the Vedas was vessel and the milk was devotion. When the gods milked the earth through Mitra(the Sun) then Indra was the calf and superhuman power was the produce. The gods had a gold vessel at the time of milking the cow.[29] When the Pitṛs milked the cow, they had the vessel of silver, Antaka(death) was the milker of the cow, Yama became the calf and Svadhā was the juice. In milking of the cows by Nāgas, serpent Dhṛtarāṣṭra became the milkman, Takṣaka, the lord of serpents became the calf, gourd was the vessel and poison was the produce.[30] When demons milked the cow then Māyā was the milk, Virocana the son of Prahlāda was the calf, the milker was Dvimūrddhā and the vessel was of iron.[31] When Yakṣas milked the cow, Vaiśravaṇa was made the calf, vessel was of clay, milk was the power of disappearing.[32] The Rākṣasas as well as the Pretas employed Raupyanābha as the milker, their calf was Sumālī and milk was blood.[33] The Apsarās and the Gandharvas made Caitraratha the calf and milked the fragrance of earth in a lotus leaf from the earth. Gandharva Vararuci , the excellent dancer was the milkman then. When the mountains milked the earth then Sumeru was the milker, Himavān was the calf, the vessel was of crystal and the milk was divine oṣadhis and precious gems.[34] When the trees milked the power of regermination

in a leaf of *Palāśa,* then *Śāla* was the milkman and *Plakṣa* was the calf. In the same manner everyone who milked the earth, received the desired fruit.[35] It is stated in the *Brahma Purāṇa* that as the earth yields everything that everyone desires. It grows all plants. It extends to the ocean. So earth is well-known as Medinī-

sarvakāmadudhā dogdhrī
sarvasasyaprarohiṇī/āsīdiyaṁ
samudrāntā medinī pariviśrutā.[36]

The descriptions of milking the earth that occur in the *Bhāgavata Purāṇa* and Brahma *Purāṇa* are almost same as in the *Matsya Purāṇa.*

Conclusion

Thus, Pṛthu is associated with the legend of his chasing the earth goddess Pṛthivī, who fled in the form of a cow and ultimately agreed to yield her milk as the world's grain and vegetation. As a result of which, all kinds of corn and vegetables were obtained from the earth which provided sustenance for people continuously. Even now the process continues and it will never end. As Pṛthu granted life to the Earth so Pṛthu was her father, hence she was called Pṛthivī(the daughter of Pṛthu), the name derived from the name of her father.[37]

Endnotes

[1]Nir., 3.19

[2]Vā.P., 1.203

[3]sargo'syātha visargaśca vṛttī rakṣāntarāṇi ca/
vaṁśo vaṁśyānucaritaṁ saṁsthā hetorapāśrayaḥ//
daśabhirlakṣanairyuktaṁ purāṇaṁ tadvido viduḥ// Bhā.P., XII.7.9-10

[4]M.P., 53.65; Vā.P., 4.11

[5]brahmāviṣṇvarkarudrāṇāṁ māhātmyaṁ bhuvanasya ca/
sasaṁhārapradānāṁ ca purāṇe paṅcavarṇake// M.P., 53.66

[6]itihāsapurāṇābhyāṁ vedaṁ samupabṛṁhayet// Cf., Śrī Sāyaṇācārya , Ṛgveda-Bhāṣya-Bhūmikā , p. 137

[7]http://wiktionary.org

[8]Śabdakalpadrumaḥ, Vol. 1, p. 165
Sarma, Kiran, Saṁskṛt-Asamiyā Abhidhān, p. 58

[9]Vide, Apte, V.S., The Practical Sanskrit-English Dictionary, p. 202

[10]Williams, M.M., A Sanskrit-English Dictionary, p. 129

[11]Vide, Encyclopedia Britannica, Vol. 7, p.58

[12]Vide, Hastings James, The Encyclopedia of Religion and Ethics, 2 Vol. IX, p.118

[13]Vide, Bhattacharji Sukumari, Literature in the Vedic Age, Vol. I. p.128

[14]Bhā. P., IV.17,18 ; Vi. P., I.13.68-87; Brahmāṇḍa Purāṇa, I.2.36.175-202; Br.P., 2.70 ff. ; M.P., Ch.10

[15]AV., VIII.10.11-12

[16]Ṛ.V., 8.9.10

[17]J.B., I.186

[18]pṛthī ha vai vainyo manuṣyāṇāṁ prathamo'bhiṣiṣice so'kāmayata sarvvamannādyamavarundhīyeti tasmā'etānyajuhavuḥ sa idaṁ sarvamannādyamavarurudhe…// Ś.B., V.3.5.4

[19] pṛthurvainyastathā caimāṁ rarakṣa kṣatrapūrvajaḥ/
rājasūyābhiṣiktānāmādyaḥ sa vasudhādhipaḥ//\ Br.P., I.81

[20] Sāyaṇa,Ś.B., V.3.5.4

[21] svapāṇau puruṣavyāghro dudoha pṛthivīṁ tataḥ/
sasyajātāni sarvāṇi pṛthurvainyaḥ pratāpavān//
tenānnena prajāḥ sarvāḥ varttante'dyāpi sarvaśaḥ// Br.P., 2.96-97

[22] arājake nṛpaśreṣṭha dharitryā sakalauṣadhīḥ/
grastāstataḥ kṣayaṁ yānti prajāḥ sarvāḥ prajesvaraḥ//
tvaṁ no vṛttiprado dhātrā prajāpālo nirūpitaḥ/
dehi naḥ kṣutparītānāṁ prajānāṁ jīvanauṣadhīḥ// Vi.P., I.13.66-67

[23] Ibid.,I.13.68-73

[24] prajānāmupakārāya yadi māṁ tvaṁ haniṣyasi/
ādhāraḥ kaḥ prajānāṁ te nṛpaśreṣṭha bhaviṣyati// Ibid.,I.13.74

[25] tvaṁ hatvā vasudhe vāṇairmacchāsanaparāṅmukhīm/
ātmayogabalenemā dhārayiṣyāmahaṁ prajāḥ// Ibid.,I.13.75

[26] Ibid.,I.13.77-80

[27] Ibid.,I.13.81-86

[28] M.P., Ch. 10

[29] Ibid., 10.16-18

[30] Ibid., 10.19-20

[31] pātre māyāmabhūdvatsaḥ prāhlādistu virocanaḥ/
dogdhā dvimūrddhā tatrāsīnmāyā yena pravartitā// Ibid., 10.21

[32] yakṣaiśca vasudhā dugdhā purāntarddhānamīpsubhiḥ/
kṛtvā vaiśravaṇaṁ vatsamāmapātre mahīpate// Ibid., 10.22

[33] pretarakṣogaṇairdugdhā dhārārudhiramulbaṇam/
raupyanābho'bhavaddogdhā sumālī vatsa eva tu// Ibid., 10.23

[34] Ibid., 10.24-26

[35] Ibid., 10.27-28

[36] Br.P., 2.111

[37] śasyajātāni sarvāṇi prajānāṁ hitakāmyayā/
tenānnena prajāstāt varttante'dyāpi nityaśaḥ//
prāṇapradānāt sa pṛthuryasmād bhūmerabhūt pitā/
tatastu pṛthivīsaṁgyāmavāpākhiladhāriṇī//
Vi.P., I.13.87-88

References

Bhattacharji, Sukumari. (1984). Literature in the Vedic Age, Vols. I &II. Calcutta. K.P. Bagchi & Company.

Dikshitar, V.R. Ramachandra. (1951). The Purāṇa Index (in three volumes). Delhi. Motilal Banarsidass.

Eggeling, Julius. (1963). The Śatapatha Brāhmaṇa , under The Sacred Books of the East, Vols. 12,26,41,43 & 44. Delhi. Motilal Banarsidass.

Hazra, R.C. (1940). Studies in the Purāṇic Records on Hindu Rites and Customs. The University of Dacca.

Hillebrandt, Alfred. (1891). Vedic Mythology, Vol.- II. Delhi . Motilal Banarsidass.

Joshi, K. L. (Ed.). (2009). The Viṣṇu-Purāṇam. Parimal Publications. Sanskrit texts with English Translation.

Joshi, K. L. (Ed.). (2007). Matsya Mahāpurāṇam. Parimal Publications. Sanskrit texts with English Translation.

Kumar, P. (Ed.). (2006). The Garuḍa Mahāpurāṇam. Eastern Book Linkers. Sanskrit texts with English Translation.

Kumar, P. (Ed.). (2009). The Śrīmadbhāgavata Mahāpurānaṁ. Eastern Book Linkers. Sanskrit texts with English Translation.

Patil, Devendrakumar Rajaram. (1946). Cultural History from the Vāyu Purāṇa. Delhi. Motilal Banarsidass.

Sarmah, S.K. (Tr.). (2008). Vāyu Mahāpurāṇam. Parimal Publications. Sanskrit texts with English Translation.

Sarup, Lakshman. (1920). The Nighaṇṭu and the Nirukta of Śrī Yāskācārya. Delhi. Motilal Banarsidass.

Winternitz, M. (1981). A History of Indian Literature, Vol.-I. Delhi. Motilal Banarsidass.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Concept of Triguṇas in the Śrīmadbhagavadgītā: An Analysis

Gyanashree Bhuyan[1] and Chandan Hazarika[1*]

Accepted : 20 June, 2026

Abstract

The concept of Triguṇas is an important part of the ancient Sanskrit Holy text 'Śrīmadbhagavadgītā', which is composed by Vedavyāsa. It is a part of the Hindu epic Mahābhārata. In this text, Lord Krishna explains the concept of Triguṇas to his great friend Arjuna, during the Kurukṣetra War. In the Gītā, the concept of Triguṇas refers to three substances of Prakṛti , viz Sattva, Rajas and Tamas which influence all existence, including the human body and mind. Gītā elaborates these three guṇas are born of Prakṛti and Prakṛti is a part of the God, which is also referred as Māyā. The 14th chapter of Gītā called 'Guṇatrayavibhāgayoga' is based on the explanation and relevance of Triguṇa in empirical and spiritual life. These three guṇas find place in various context of the Gītā such as knowledge, action, food, buddhi etc, which offers a comprehensive framework for understanding personality,

*Correspondence :
Email: chandanhazarika504@gmail.com

[1]Department of Sanskrit
Nagaon University, Nagaon, Assam-782001

Published offline : 7 August

consciousness, personal transformation and behavior that remains relevant today. Therefore, the aim of this paper is to discuss the concept of Triguṇas and its place in different context on the basis of Bhagavadgītā.

Keywords Triguṇas; Śrīmadbhagavadgītā; Prakṛti; Māyā

Introduction

The Śrīmadbhagavadgītā referred to simply as the 'Gītā' comprises 18 chapters and 700 verses. The Gītā elaborates Triguṇas and its impacts when Krishna motivates Arjuna to fight a righteous war. The word 'Triguṇa' comprises two words, 'Tri' and 'Guṇa'. Here, Tri means three and Guṇa means the mental state, individual abilities and habits. It has been referred in the Gītā as three essential elements of Prakṛti called as Sattva, Rajas, and Tamas. Understanding the concept of Triguṇa can guide individuals on a path to a virtuous life and impacting personal transformation and even providing insight into transformational leadership. The Bhagavadgītā's concept of the Triguṇa is based on the Prakṛti concept from the Sāṃkhya philosophy. Both describe Sattva, Rajas and Tamas as the three fundamental attributes or forces of material nature, which govern all existence.

Objectives of the Study

The objectives of the study are mentioned below :

1. A theoretical study on Triguṇas and its place on various context of Bhagavadgītā.
2. A study on how these three guṇas influence all existence including human body and mind.

Importance of the Study

The concept of Triguṇa in the Bhagavad Gita is important for understanding the interplay of sattva, rajas, and tamas in shaping personality, behavior, and well-being. It provides a framework to analyze how different three guṇas influence a person's thoughts, emotions, actions and behaviors.

Research Methodology

In this paper, descriptive, comparative and analytical methodologies are used.

Review of Literature

The following are a review of some related literature on the 'concept of Triguṇas in the Gītā':

1. M R Sandhya and M.V Vinod Kumar emphasized about the concept of Triguṇas in their article, "Critical Insight in Concept of Triguṇa: A Review". They explained that

all the three guṇas are equally important for a human being. For the very basic things like sleeping Tamas is important, for awakening Sattva is needed and in the case of dreams Rajas play an important role. They are mutually dominating, supporting, productive and co-operating.

2. Keshar Jung Magar emphasized about the 'Triguṇa' in his journal "Bhagavad Gītā's Triguṇa Prakṛti on Teachers and Student's Behaviour: A Reflective Study." He explains that teachers and students should overcome laziness and negligence and conquer Tama guṇa, Raja guṇa should be controlled by doing good deeds and Sattva guṇa should be established by giving up ego and pride.

3. Suresh N emphasized about the 'Triguṇa' in his thesis "Development of personality model based on Triguṇa of Sāṃkhya philosophy". He explains that Triguṇas - Sattva, Rajas and Tamas have profound roles in determining the behavioral characteristics of a person and thus they are most effective in framing personality and in making of variant personality patterns.

Sāṁkhya's concept of Triguṇas in Gītā

According to the, Sāṁkhya philosophy, Prakṛti(matter) is defined as the unmanifest and the root cause of all worldly existence, which is the state of equilibrium of Triguṇas, viz Sattva, Rajas and Tamas.1 Therefore, Prakṛti is considered as the 'Triguṇatmaka'(Hazarika 2013: 37).The nature of this three guṇas are pleasure, pain and delusion respectively, they served the purpose of illumination, action and restraint and they are mutually dominating, supporting, productive and cooperative.[2] Sattva is considered to be 'laghu' or 'light' and illuminating, Rajas is exciting and mobile and Tamas is heavy and enveloping. Like a lamp, they cooperate for a purpose.[3] It is a matter of common observation that the wick and oil, though opposed to the action of fire, when brought together, cooperate to perform the task of giving light. Triguṇas are also though contradictory to each other, cooperate and effect their single purpose of bringing about the emancipation of the Puruṣa(Virupakshananda 1995:46) These guṇas are not qualities of Prakṛti,

but rather than actual constituents that make up Prakṛti itself. In the Śvetāśvatara Upaniṣad, Nature or Prakṛti is described as producing three colours, lohita is red, śukla is white and kṛṣṇa is black. These colours are interpreted as the three guṇas. Red stands for rajas, white stands for sattva and black stands for tamas. These guṇas make the one reality give rise to many living beings.[4] In the chāndogya Upaniṣad, the three colours also represent the three main elements,viz fire water and earth. Fire is red, water is white and earth is black.[5]

Gītā confirms that Prakṛti is the material cause of all existence. Lord Krishna reveals that His Primordial Nature (Mūla Prakṛti) known as the great Brahman, which is the womb of all creatures. The creation of all being follows from the union of Puruṣa and Prakṛti.[6] Here, Prakṛti is considered as a female part of God. God himself casts the seeds into her womb and therefrom is produced all beings.[7] It describes the cosmic origin of life, where the divine essence of God (Krishna) creates the universe by manifesting within the material nature (Prakṛti). This material nature is consists of Triguṇas,viz Sattva, Rajas and Tamas, attach the soul to the physical body.[8] In the Gītā, Prakṛti is a part of God and Sattva, Rajas and Tamas are the products of this Prakṛti. These guṇas also connected with the three forms of Prajāpati. In the Maitrāyaṇīya Upaniṣad, the Prajāpati is called by his three primary forms as Brahmā, Rudra and Vishnu. His Rājasic aspect is Brahma, his tāmasic aspect is Rudra and his sattvic aspect is Vishnu.[9]

Sattva guṇa and its characteristics

Sattva guṇa is one of the three guṇas in Gītā. It is the quality of purity, light and wisdom that brings about goodness, harmony and contentment. It is associated with a state of clarity and peace.

Gītā explains characteristics of Sattva guṇa as follows:

1. Sattva is immaculate, luminous, and free from illness. It brings clarity and purity of mind, from confusion and inertia and also leads to a binding attachment to happiness and Knowledge.[10]
2. It produces knowledge and wisdom, which leads to a person to see things as they are and make wise decisions.[11]
3. It brings a feeling of contentment, peace, and natural joy.[12]
4. Those who live in the

quality of Sattva move upward like Heaven.[13]

5. A person who dies in the state of Sattva guṇa, attains the pure immaculate worlds of those who have realized the highest truth.[14]

Rajas guṇa and its characteristics

Rajas is the one of the three guṇas in Gītā, which is born of desire and attachment, it is the force that drives individuals to act out of desire and attachment, ultimately binding them to the consequences of those actions and the endless cycle of karma.

The characteristics of Rajas guṇa in Gītā are as follows :

1. Rajas is the nature of passion, which is born of desire and attachment.[15]
2. It binds the soul through attachment, to actions and their results.[16]
3. When the mode of Rajas guṇa is dominant, the symptoms like greed, restless activity, a selfish desire for the fruits of action are developed.[17]
4. Those who dies while in the state of Rajas, are reborn among people attached to action and worldly activities.[18]

Tamas guṇa and its characteristics

Tamas is in contrast to Sattva and Raja guna, which is born of ignorance and deludes all beings, binding them through error, laziness and sleep. This binding is a consequence of forgetting one's true, eternal nature as the self and identifying with the transient body.

Gītā describes the characteristics of Tamas guṇa as follows:

1. Tama is the deluder of all those who look upon the body as their own self, which is born of darkness or ignorance.[19]
2. It binds the individual soul through laziness, confusion, ignorance and sleep.[20]
3. Inertia, delusion, disinclination to perform one's obligatory duties- all these appear in the growth of Tamas.[21]
4. If a person dies with Tamas guṇa, they are reborn in lower forms of life and lives as creatures with limited awareness, such as insects, animals etc.[22]

Gītā elaborates the three guṇas - Sattva, Rajas and Tamas are in a constant state of competition for dominance in the mind. When one guṇa becomes dominant, it temporarily suppresses the

others. Sometimes Sattva dominates Rajas and Tamas, sometimes Rajas dominate Sattva and Tamas and sometimes Tamas overcomes Sattva and Rajas.[23] When the mode of Sattva or goodness is dominant, it prevails over the other two qualities. This leads to a state of serenity, happiness and purity.[24] When the mode of Rajas or passion becomes dominant, it overwhelms the other two. It leads to agitation, ambition, envy, and sensual desires.[25] When the mode of Tamas or ignorance is dominant, it leads to qualities like laziness, sleepiness, anger, and delusion.[26] When a soul transcends the three material modes of nature-Sattva, Rajas and Tamas, it becomes free from cycle of birth, death, old age and suffering and attains immortality.[27] This state is achieved by moving beyond identification with the body and the material world, leading to liberation and a higher eternal form of happiness.

Māyā and Triguṇas

In the Gītā, the concept of the Triguṇas also connected with the word 'Māyā', the divine illusory power of Krishna. The Śvetāśvatara Upaniṣad explained that the power of the luminous Cosmic Self (devātamaśaktim) is the cause of the universe. Brahman is 'Self-luminous'.The power of Brahman is called Māyā. This māyā is hidden by its own guṇas,viz sattva, rajas and tamas.[28] This Upaniṣad also describes Brahman as a vast wheel (Brahmacakra), which embraces the entire universe. The Māyā is the rim(nemi),i.e circumference of the wheel, hidden by its three guṇas viz sattva, rajas and tamas.[29] Brahman is veiled by these guṇas, for which we cannot see Him. In Advaita Vedanta of Śaṅkarācārya, Māyā is considered as Avidyā or Ajñana. This Ajñana is considered Anirvacanīya (indescribable), It is neither real (sat) nor unreal (asat), and therefore, its nature is said to be indescribable. It is opposed to knowledge (Jñana-virudhi), because it is destroyed by the realization of true knowledge. It is not a mere absence of knowledge, but a positive entity that actively produces the world(bhava-rupam). The Ajñana or Māyā is made of Triguṇas,viz Sattva, Rajas and Tamas.[30] Therefore Māyā is called 'Triguṇatmakam.' In the Gītā, Krishna reveals that the illusion and material world we experience are powered by His divine energy, known as Māyā. This Māyā is composed of the three Guṇas, viz Sattva, Rajas and Tamas. Therefore, he called Māyā as 'Triguṇamayī.' It states that this divine energy is difficult to overcome, it can be possible by those who surrender to the Lord.[31]

Triguṇas in various context of Gītā

The three Guṇas, viz sattva, rajas

and tamas finds place in various contexts of Bhagavadgītā. Such as-

Food

On the basis of Triguṇas, Gītā elaborates three kinds of food,viz Sattvika, Rājasika and Tāmasika. Sāttvika foods are juicy, substantial and naturally agreeable. This type of food promotes longevity, intelligence, health and happiness, preferred by people endowed with Sattva guṇa.[32] Because they nourish the body and mind, leading to positive physical and mental well-being. Rājasika foods are bitter, sour, salty, overhot, dry and burning. It promotes suffering, grief and sickness, preferred by people endowed with Rajas guṇa.[33] Tāmasika foods are ill-cooked, tasteless, stale, polluted and impure, are preferred by people endowed with Tamas guṇa.[34] It is associated with dullness, insensitivity and lack of discrimination.

Action

In the context of action, Gītā discussed three kinds of action,viz Sattvika, Rājasika and Tāmasika on the basis of Triguṇas. Sāttvika action is scripture prescribed, free from attachment and the ego does, performed without love or hatred and done by one not desirous of the reward.[35] This type of action is considered best, leading to inner peace and a connection with the divine distinguishing it from actions driven by desire or attachment. Those performed with great effort, a desire for the results or rewards of the action and a strong sense of ego, is declared as Rājasika action.[36] This action is undertaken with the intent of getting something in return, whether it's a material reward, recognition or pleasure. Tāmasika action performed in the mode of ignorance, without regard for the potential consequences, loss, harm to oneself and others or one's own ability.[37]

Knowledge

In the context of Knowledge, Gītā mentioned three types of knowledge, viz Sattvika, Rājasika and Tāmasika knowledge on the basis of Triguṇas. Sāttvika knowledge or pure knowledge is that by which one sees the single, undivided, imperishable essence of the Brahman within all diverse living beings.38 This knowledge is the basis for developing selfless action and harmonious perspective on life and leads to a deeper understanding of the universe. Again that knowledge, which is the perception of distinct, separate entities in all beings, such as differences in race, class, and form, rather than seeing the underlying unity of all existence, is declared as Rājasika knowledge.[39] It emphasizes the individuality of each being and perceives them as disconnected from one another. Tāmasika knowledge is a narrow,

irrational and baseless understanding that sees only the gross body as the whole reality, failing to perceive any deeper truth or the essence of Self or Ātman.[40] This knowledge is self- centered and the belief that the physical body is the Self (Ātman) and there is nothing beyond it.

Sacrifice

Gītā explained that there are three kinds of sacrifice (yajña), viz. Sāttvika, Rājasika and Tāmasika sacrifice on the basis of Triguṇas. Sāttvika sacrifice is a ritual performed without expecting any results, in accordance with scripture rules and with the mind firmly resolved that it is a duty to be performed.[41] This sacrifice is performed without any desire for personal gain or rewards. Rājasika sacrifice is performed with the intent of gaining a personal reward and for pride or display.[42] The person who performs this sacrifice is focused on achieving personal outcome. Due to the attachment to results and the self-centered motive, the performer loses its spiritual purity and connection to the divine. Tāmasika sacrifice performed without adherence to scripture, chanting of Vedic hymns or offerings to priests and especially without faith.[43] This sacrifice highlights that actions performed without faith and proper ritual are not spiritually beneficial but are instead based on ignorance and will not lead to happiness.

Pleasure

In the context of pleasure ,Gītā stated three kinds of pleasure,viz Sāttvika, Rājasika and Tāmasika pleasure on the basis of Triguṇas. That which feels like poison at the beginning, but tastes like nectar in the end in the mode of goodness, is declared as sāttvika pleasure.[44] i.e this happiness is achieved through practices of self knowledge, pure intellect, disciplined self-control,which may be difficult at first but lead to lasting inner and self realisation. Rājasika pleasure arises from the temporary contact of the senses with their objects, which initially feels like nectar, but ultimately leads to anxiety, exhaustion etc, similar to poison.[45] It serves a powerful warning against mistaking temporary excitement for true happiness and recognize that true happiness doesn't come from chasing temporary pleasures, but from cultivating higher forms of contentment. That pleasure which arises from sleep, laziness, negligence and deludes the self during the enjoyment as well as in the end, is declared as Tāmasika pleasure.[46] This type of pleasure is characterized by spiritual blindness, mental dullness, and a binding effect on the individual to the cycle of delusion and suffering. By understanding the nature of this joy, one can consciously choose to move away from destructive habits and

towards actions that promote spiritual advancement and higher consciousness.

Buddhi

In the context of Buddhi or intellect, Gītā stated three kinds of Buddhi, viz Sāttvika, Rājasika and Tāmasika intellect on the basis of Triguṇas. That which intellect can correctly discern the nature of actions, distinguishing between engagement(pravṛtti) and withdrawal (nivṛtti), duty (Kārya) and non-duty (Akārya), and what is binding (Bandha) and what is liberating (Mokṣa), is called as Sāttvika Buddhi.[47] This intellect allows for wise decision making, guiding one forward righteous action and spiritual freedom. It is the highest form of intellect, based on the true nature of things. Rājasika Buddhi, defined as an intellect that cannot clearly distinguish between right (Dharma) and wrong (Adharma), duty and non-duty, due to the influence of passion, attachment and confusion. This understanding is described as Ayathāvat,i.e it is not true or perfect.[48] It lacks the spiritual awareness to perceive internal truths and leads to a confused state in decision making. Tāmasika intellect is that which imagines even Adharma to be Dharma and sees all other things opposite under the influence of Tamas guṇa.[49] It leads to a fundamentally wrong understanding of reality, resulting in actions that go against ethical and moral principles.

Conclusion

Discussing the concept of Triguṇas in the Gītā is valuable because it provides a universal framework for understanding and analyzing human behavior and consciousness. From the above discussion we can say that, the Gītā describes Triguṇas by their psychological action in man and in other things such as food in accordance with the psychological effect.The Triguṇa concept offers a holistic framework for understanding human personality, behaviour and explaining individual differences. No living being, anywhere in the universe, whether on earth or among the gods, is free from Sattva, Rajas and Tamas - these three modes of material nature.[50] Through complete surrender and unwavering devotion to the Divine, a person can rise above the three Guṇas of material nature.[51] An imbalance, particularly an increase in Rajas and Tamas, is linked to mental disturbances. By recognising one's prevalent guna, individuals can cultivate self-awareness and work to increase Sattva, leading to greater inner harmony and spiritual progress. To structure future work around the concept of Triguṇa, research can explore its application across a variety of modern fields including psychology, healthcare etc.

Endnotes

[1]Sattvarajastamasāṁ sāmyāvaśthāṁ Prakṛtih. Sāṁkhyasūtram, 12

[2]Prītyaprītiviṣādātmakḥ prakāśapravṛttiniyamārthāḥ/

anyonyābhibha āvāśrayajananamithunavṛttayaś ca guṇāḥ// Sāṃkhyakārikā, 12

[3]sattvaṁ laghu prakāśakamiṣṭamupaṣṭambhakaṁ calaṁ ca rajaḥ /guru varaṇakameva tamaḥ pradīpavaccārthato vṛttiḥ //Sāṃkhyakārikā, 13

[4]ajām ekāṁ lohitaśuklakṛṣṇāṁ bahvīḥ prajāḥ sṛjamānāṁ sarūpāḥ/ ajo eko juṣamāṇo'nuśete jahāty enāṁ bhuktabhogām ajo'nyaḥ //Śvetāśvatara Upaniṣad, 4.5

[5]Yad agne rohitam rūpaṃ tejasas tad rūpaṃ yac chuklaṃ tad apāṃ yat kṛṣṇaṃ tad annasyāpāgād agner agnitvaṃ vācārambhaṇaṃ vikāro nāmadheyaṃ trīṇi rūpāṇīty eva satyam. Chāndogya Upaniṣad 6.4.1

[6]mama yonir mahad brahma tasmin garbhaṁ dadhāmy aham/sarva-bhūtānāṁ tato bhavati bhārata// Bhagvadgītā, 14.3

[7]sarva-yoniṣhu kaunteya mūrtayaḥ sambhavanti yāḥ / tāsāṁ brahma mahad yonir ahaṁ bīja-pradaḥ pitā// Bhagavadgītā, 14.4

[8]sattvaṁ rajas tama iti guṇāḥ prakṛiti-sambhavāḥ/ nibadhnanti mahā-bāho dehe dehinam avyam// Bhagavadgītā, 14.5

[9]prajāpatisya proktā agryās tanavo brahmā rudro viṣṇur ity atha yo ha khalu vāvā asya rājaso aṁśo asau sa yo ayaṁ brahmātha yo ha khalu vāvā asya tāmaso aṁśo asau yo ayaṁ sa yo ayaṁ rudro atha yo ha khalu vāvā asya sāttviko aṁśo asau sa evaṁ viṣṇuḥ// Maitrāyaṇīya Upaniṣad, 5.2

[10]tatra sattvaṁ nirmalatvāt prakāśhakam anāmayam/ sukha-saṅgena badhnāti jñāna-saṅgena chānagha// Bhagavadgītā', 14.6

[11]sattvāt sañjāyate jñānaṁ / Bhagavadgītā, 14.17

[12]sattvaṁ sukhe sañjayatim /Bhagavadgītā 14.9

[13]ūrdhvaṁ gachchhanti sattva/ Bhagavadgītā 14.18

[14]yadā sattve pravṛiddhe tu pralayaṁ yāti deha-bhṛit / tadottama-vidāṁ lokān amalān pratipadyate// Bhagavadgītā 14.14

[15]rajo rāgātmakaṁ viddhi tṛiṣhṇā-saṅga-samudbhavam // Bhagavadgītā 14.7

[16]tan nibadhnāti kaunteya karma-saṅgena dehinam // Bhagavadgītā 14.7

[17]lobhaḥ pravṛittir ārambhaḥ karmaṇām aśhamaḥ spṛihā / rajasy etāni jāyante vivṛiddhe bharatarṣhabha// Bhagavadgītā 14.12

[18]rajasi pralayaṁ gatvā karma-saṅgiṣhu jāyate. Bhagavadgītā , 14.15

[19]tamas tv ajñāna-jaṁ viddhi mohanaṁ sarva-dehinām // Bhagavadgītā , 14.8

[20]pramādālasya-nidrābhis tan nibadhnāti bhārata // Bhagavadgītā , 14.8

[21]aprakāśho'pravṛittiśh cha pramādo moha eva cha / tamasy etāni jāyante vivṛiddhe kuru-nandana // Bhagvadgītā, 14.13

[22]tathā pralīnas tamasi mūḍha-yoniṣhu jāyate // Bhagvadgītā, 14.15

[23]rajas tamaśh chābhibhūya sattvaṁ bhavati bhārata / rajaḥ sattvaṁ tamaśh chaiva tamaḥ sattvaṁ rajas tathā // Bhagvadgītā, 14.10

[24]sarva-dvāreṣhu dehe 'smin prakāśha upajāyate/ jñānaṁ yadā tadā vidyād vivṛiddhaṁ sattvam ity uta// Bhagvadgītā, 14.11

[25]lobhaḥ pravṛittir ārambhaḥ karmaṇām aśhamaḥ spṛihā/ rajasy etāni jāyante vivṛiddhe bharatarṣhabha // Bhagvadgītā, 14. 12

[26]aprakāśho' pravṛittiśh cha pramādo moha eva cha / Tamasy etāni jāyante vivṛiddhe kuru-nandana// Bhagvadgītā, 14.13

[27]guṇān etān atītya trīn dehī deha-samudbhavān / janma-mṛityu-jarā-duḥkhair vimukto' mṛitam aśhnute // Bhagvadgītā, 14.20

[28]té dhyānayōgānugatā apaśyan Devātmaśaktiṁ svaguṇair nigūḍhām / Śvetāśvatara Upaniṣad, 1.3

[29]taṃ ekanemiṃ trivṛtaṃ ṣoḍaśāntaṃ śatārdhāraṃ viṃśatipratyarābhiḥ / Śvetāśvatara Upaniṣad, 1.4

[30]ajñānaṃ tu sadasad-bhyām anirvacanīyaṃ triguṇātmakaṃ jñāna-virodhi bhāvarūpaṃ yatkiñcid iti // Vedāntaśārā, p.g 28

[31]daivī hyeṣhā guṇa-mayī mama māyā duratyayā / mām eva ye prapadyante māyām etāṁ taranti te // Bhagvadgītā, 7. 14

[32]āyuḥ-sattva-balārogya-sukha-prīti-vivardhanāḥ / rasyāḥ snigdhāḥ sthirā hṛidyā āhārāḥ sāttvika-priyāḥ // Bhagvadgītā, 17.8

[33]kaṭv-amla-lavaṇāty-uṣhṇa- tīkṣhṇa-rūkṣha-vidāhinaḥ / āhārā rājasasyeṣhṭā duḥkha-śhokāmaya-pradāḥ // Bhagvadgītā, 17.9

[34]yāta-yāmaṁ gata-rasaṁ pūti paryuṣhitaṁ cha yat / uchchhiṣhṭam api chāmedhyaṁ bhojanaṁ tāmasa // Bhagvadgītā, 17.10

[35]niyataṁ saṅga-rahitam arāga-dveṣhataḥ kṛitam / aphala-prepsunā karma yat tat sāttvikam uchyate // Bhagvadgītā, 18.23

[36]yat tu kāmepsunā karma sāhankārena vā punaḥ / kriyate bahulāyāsaṁ tad rājasam udāhṛitam // Bhagvadgītā, 18.24

[37]anubandhaṁ kṣhayaṁ hinsām anapekṣhya cha pauruṣham / mohād ārabhyate karma yat tat tāmasam

uchyate // Bhagvadgītā, 18.25

[38]sarva-bhūteṣhu yenaikaṁ bhāvam avyayam īkṣhate / avibhaktaṁ vibhakteṣhu taj jñānaṁ viddhi sāttvikam // Bhagvadgītā, 18.20

[39]pṛithaktvena tu yaj jñānaṁ nānā-bhāvān pṛithag-vidhān / vetti sarveṣhu bhūteṣhu taj jñānaṁ viddhi rājasam//Bhagvadgītā, 18.21

[40]yat tu kṛitsna-vad ekasmin kārye saktam ahaitukam / atattvārtha-vad alpaṁ cha tat tāmasam udāhṛitam // Bhagvadgītā, 18.22

[41]aphalākāṅkṣhibhir yajño vidhi-driṣhṭo ya ijyate / yaṣhṭavyam eveti manaḥ samādhāya sa sāttvikaḥ // Bhagvadgītā,17.11

[42]abhisandhāya tu phalaṁ dambhārtham api chaiva yat / ijyate bharata-śhreṣhṭha taṁ yajñaṁ viddhi rājasam // Bhagvadgītā,17.12

[43]vidhi-hīnam asṛiṣhṭānnaṁ mantra-hīnam adakṣhiṇam/ Śhraddhā-virahitaṁ yajñaṁ tāmasaṁ parichakṣhate// Bhagvadgītā, 17.13

[44]yat tad agre viṣham iva pariṇāme ‘mṛitopamam / Tat sukhaṁ sāttvikaṁ proktam ātma-buddhi-prasāda-jam// Bhagvadgītā, 18.37

[45]viṣhayendriya-sanyogād yat tad agre amṛitopamam/ pariṇāme viṣham iva tat sukhaṁ rājasaṁ smṛitam // Bhagvadgītā, 18.38

[46]yad agre chānubandhe cha sukhaṁ mohanam ātmanaḥ/ nidrālasya-pramādotthaṁ tat tāmasam udāhṛitam // Bhagvadgītā, 18.39

[47]pravṛittiṁ cha nivṛittiṁ cha kāryākārye bhayābhaye/ bandhaṁ mokṣhaṁ cha yā vetti buddhiḥ sā pārtha sāttvikī // Bhagvadgītā, 18.30

[48]yayā dharmam adharmaṁ cha kāryaṁ chākāryam eva cha / ayathāvat prajānāti buddhiḥ sā pārtha rājasī // Bhagvadgītā, 18.31

[49]adharmaṁ dharmam iti yā manyate tamasāvṛitā / Sarvārthān viparītānśh cha buddhiḥ sā pārtha tāmasī // Bhagvadgītā, 18.32

[50]na tad asti pṛithivyāṁ vā divi deveṣhu vā punaḥ / sattvaṁ prakṛiti-jair muktaṁ yad ebhiḥ syāt tribhir g māṁ uṇaiḥ // Bhagvadgītā, 18.40

[51]māṁ cha yo avyabhichāreṇa bhakti-yogena sevate / sa guṇān samatītyaitān brahma-bhūyāya kalpate // Bhagvadgītā,14.26

References

Śrīmad Bhagavadgītā, Gita Press, Gorakhpur, 2010

Sāṃkhyasūtram by Kapil, Kunjabihari Tarksidhanta, Calcutta, 1918

Sāṃkhyakārikā by Isvarakrishna, Pt. Dhundhiraj Shastri, Chowkhamba Sanskrit Series, Varanasi, 2016

Sāṃkhyakārikā-Vimarśa, Chandan Hazarika, Krantikaal Prakashan, Nagaon, 2013

Śvetāśvatara Upaniṣad, Swami Lokeswarananda,

The Ramakrishna Mission Institute of Culture, Calcutta, 1994

Vedāntasāra of Sri Sadananda, Dr. Gajanan Shastri Musalgaonkar, Chowkhamba Krishnadas Academy, Varanasi, 2019

Bhagvadgītā, The son of God, Swami Mukundananda

Sāṃkhyakārikā of Isvarakrishna, Swami Virupakshananda, Sri Ramakrishna Math Printing press, 1995

Dynamics of Triguna Theory in the 21st Century, Brigadier (Dr) Jeewan Rajpurohit, Indian Institute of Advanced Study, Shimla, 2022

Maitrāyaṇīya Upaniṣad, E.B Cowell, The Asiatic Society of Bengal

Chāndogya Upaniṣad, Gita Press, Gorakhpur

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Revisiting Tribal Philosophy in the Context of Biodiversity Conservation : A Study of the Tiwa Tribe of Assam

Papori Dewri[1] and Nabaprasad Nath[1*]

Accepted : 11 July, 2026

Abstract

The planet Earth faces severe ecological challenges, especially because of human lifestyles. The situation of India is not an exception to that. It is one of the 12 most mega-diverse regions, with 7.7% of the world's genetic resources. However, its biodiversity has declined rapidly in recent decades. While there has been a growing concern among technocrats, bureaucrats, politicians and others who aim to restore ecological balance, the outcomes remain inadequate. Notably, several tribal communities in India maintain a deep ecological consciousness through traditional, nature-centric lifestyles. The Tiwa tribe in Assam is one of such examples. Their worldview is rooted in indigenous ecological knowledge, promoting a balanced relationship with their natural surroundings. The

*Correspondence :
Email: nabaprasad@nowgongcollege.edu.in

[1]Department of Philosophy
Nagaon University, Nagaon: Assam-782001

Published offline : 7 August

simple lifestyle of Tiwa, their traditional skills and religious practices serve as indigenous conservation mechanisms, supporting healthy ecosystems and secure livelihoods. This tribal philosophy offers valuable insights for addressing global challenges. This study examines the relevance of tribal philosophy in biodiversity conservation and sustainable livelihoods, focusing on the Tiwa tribe of Assam.

Keywords Tribal philosophy; Tiwa tribe; Biodiversity; Sustainable livelihood

Introduction

The world is at a critical juncture, facing ecological challenges that threaten human existence. Issues like climate change, deforestation, and biodiversity loss are on the rise. The focus on material growth and resource exploitation is damaging our relationship with nature and harming ecosystems. India, recognized as one of the 12 most mega-diverse regions with 7.7% of global genetic resources, is not immune. It has seen rapid biodiversity decline for decades. Though concern is rising among technocrats and officials, results so far have been inadequate. In recent times it has been observed that in the pursuit of global progress, an updated lifestyle, rapid urbanisation and excessive industrialisation have fully exploited the nature and natural resources to an unsustainable level, leading to ecological imbalance. It is no doubt that technological and industrial growth brings comfort, but also erodes natural ecosystems. Interestingly, while mainstream society often moves away from ecological ethics, many indigenous and tribal groups in India continue to live in harmony with nature. These groups follow traditional, nature-centric worldviews. They practice environmental sustainability using oral traditions, spirituality, and indigenous knowledge. The Tiwa tribe of Assam is a strong example. Their worldview is tied to religious rituals, cultural practices, and ecological knowledge. For them, nature is a living presence with spiritual meaning. Their deities are linked to rivers, forests, mountains, and agricultural cycles a sacred bond between people and the land. Community rituals and festivals strengthen ecological awareness and group responsibility. These practices help to conserve biodiversity, maintain ecological balance, and secure livelihoods. In this context, the present study tries to explore the relevance of tribal philosophy (worldview) as a pathway to biodiversity conservation and sustainable livelihood with special reference to the Tiwa tribe of Assam.

Objectives

1. To analyse the tribal worldview to identify biodiversity conservation practices.
2. To examine the role of the Tiwa community in the context of biodiversity conservation and sustainable livelihood.

Methodology

Mainly analytical and descriptive methods are taken into account. Folk materials and information are collected from different secondary sources comprising books and the internet.

Tribal Philosophy (Worldview) and the Tiwa Tribe

Every society, group and even an individual has their own philosophy. No man can live without a philosophy. The meaning of life, the way of living, joys, sorrows and values of life – all these collectively sum up into what is known as the philosophy of a man or a group of people. Along with this, aspects such as knowledge, this world and the world beyond, human actions, God, and the soul are also important components of the philosophy of an individual, group or society. It basically implies how people approach their surroundings to uncover the mystery of nature. Thus, the manner in which tribal people interact with their surroundings is known as tribal philosophy. In this regard, John S. Mbiti in his book 'African Religion and Philosophy' holds, "African philosophy refers to the understanding, attitude of mind, logic and perception behind the manner in which African people think, act or speak in different situations of life" (Mbiti 1970). Thus, tribal philosophy embodies an indigenous mode of understanding life and the universe. Here it is important to note that as tribals do not have any written scriptures, depending on certain myths, stories, folklores and rituals established by their ancestors, they see the world and live a simple life on the lap of nature, depending on it, caring for it and in turn being taken care by it (nature itself). They think of themselves as a part of nature, so they interact with nature in a very simple way and try to understand nature by living with it. Rashan Praveen Xalxo, in his article 'Tribal Philosophy: Fusion of Tradition and Modernity', mentioned that tribals never consider natural resources as personal property but rather see them as a means of their livelihood (Xalxo 2021). As they live with nature and interact with nature, they produce as per the minimum needs from nature, and this is how they are adopting a life of balanced self-reliance and self-sustainability. This is the worldview of tribals, which can itself be said as the tribal

philosophy. Therefore, tribal philosophy can be considered to be the inner voice of the community that believes in a strong sense of connection to nature, land, spirits, the supreme being and among the individual members (Ibid). It taught them the interconnectedness with nature and fellow beings (humans and animals) and, most importantly, the art of simple and sustainable livelihood.

For the tribal people, the forest, river, hills, land are regarded as living entities inhabited by spiritual forces. This deep reverence for nature shapes their rituals, festivals and livelihood activities. Therefore, in their day to day life, activities such as cultivation, hunting or gathering, fishing, using natural resources such as cutting trees and other items are often preceded by rituals to seek permission or blessings from natural spirits, demonstrating an ethic of respect and reciprocity rather than domination. The Tiwa tribe, also known as *Lalung,* is an indigenous tribal community inhabiting Assam and a few parts of Meghalaya, providing a striking example of this worldview practice. In the Tiwa community, *Cāribhāi* (a deity who is associated with rain), *Bāghdeo* (the forest deity), *Bodolmāji* (the ancestor deity), *Furimasar* (the deity of power or Surya), *Chaari Bhai Chari Kora* (a series of deities of fertility and agriculture), *Bāuli* (deity of birds, animals and insects), *Thal Pujā* and *Jal Pujā* (Earth and water worship) etc., are deities and rituals associated with various natural elements. They worshipped these deities for communal well-being as well as to seek permission or blessings from natural spirits to use the natural resources. Such ecological sensibility ensures sustainability and balance within the ecosystem. Another important aspect that can be noticed in the Tribal world is their ancestorial knowledge about life and the world. They still carry various ancestorial knowledge and wisdom, which guide them in shaping their personal and social systems, cultural practices, resource management and relationship with nature. It acts as a living repository of wisdom accumulated over generations through observation, experience and adaptation to the environment. This can be seen in folktales, folksongs, oral tradition and rituals of tribals. The Tiwa people still possess various deep ecological knowledge passed down through oral traditions, rituals and practices that help them to identify seasonal cycles, climate patterns, manage plants and wildlife sustainability. For example, *Jong khong puja* is observed in the month of *Chot* (March-April). After performing this puja, people can sow the seeds in their paddies. According to

Maneswar Deuri, for the well-being of their crops, plain Tiwas worshipped to their agricultural deity before ploughing the paddy. Although *Cāribhāi-Cārikori* is the chief deity in *Jongkhong Pujā* along with them *'Mohādeo-Pārvati', 'Bāghdeo'* and *'Jol-Thol'* devotā are also worshipped ((Deuri 2005). Again, Dhanada Kakati in her PhD dissertation mentioned that in Tiwa culture, no one can cut thatch, straw, dry raw vegetables and bamboo shoots after *Jongkhong Phujā* (in the month of May) till *LāngkhanPhujā* (in the month of October or November) (Kakati 2019). It is only after observing the *Langkhun* and *Khaaplangrawane pujas* that trees, bamboo, and other materials can be obtained (Baruah 2024). In this way, tribal people shared a relationship between men and nature. Such a tribal worldview embodies a life-centred approach that harmonizes material, social, and spiritual dimensions. It is a philosophy of coexistence, where nature is sacred, community is central and sustainability is a way of life. Understanding and recognizing such indigenous worldviews are crucial not only for preserving cultural diversity but also for rethinking contemporary ecological and ethical paradigms. The Tiwa tribe, therefore represents a living example to the deep ecological wisdom inherent in India's tribal heritage.

Tiwa Tribe and their Biodiversity Conservation Practices

The Tiwa worldview represents a living example of ecological balance and human nature relationship. In their day to day life, they use natural resources for housing, food, medicine and living in accordance with the cycle of nature (Nath and Dewri 2023). For instance, bamboo is highly valuable resource that is cultivated in almost every house. It is widely used for house construction and repair, crafting baskets and fencing, constructing sheds for cattle and pigs as well as for building granaries (Thakur 1985). They make extensive use of local plant species both as food and as traditional medicines to treat a range of ailments. For instance, *Chirta titha* is consumed, which relieves stomach disorders, stomach aches and Jaundice. *Drona* leaves help in increasing appetite. *Morapata* leaves, a delicious food item that help to reduce fever. *Pategaja* leaves are applied in cases of gall bladder disorders and *Khajam Thusli* leaves are used for Cough related issues (Nath et al., 2020; Saikia 2023). As Maneshwar Deuri observes, "not only the Tiwas but most of the tribes eat a number of bitter leaves like *moha neem, baahaakaa, bhui, bhekuri teeta and sukutaa teeta* at least two days in a week. He says the Tiwa people eat these bitter leaves for good

health" (Deuri 1997). In this way, the traditional method of treatments and care is prevalent within the Tiwa tribe. Plants are conserved by them through homestead cultivation, ensuring future availability. Again, community-based agricultural methods such as double cropping, crop rotation, mixed cropping, shifting cultivation not only protect and promote environmental diversity but also help to maintain soil nutrition, promote climate-resilient farming and food sovereignty. Instead of using chemical fertilizers, soil fertility and agricultural productivity are maintained by cow dung, organic wastes, ashes and recycling of crop residues etc. (Saikia 2023; Nath and Dewri 2023). Bandana Baruah, in her book, mentions, "Majority of the Tiwas depend upon local cow dung as manure and only a few persons apply chemical fertilizer and pesticides. Cow dung is stored in a pit of near cowshed and it carried to the fields in bullock carts or in shoulder load baskets" (Baruah 2024). These traditional practices help to sustain the environment, reflecting a worldview of harmony and coexistence.

Secondly, the Tiwa people perceive the natural world as connected with spiritual presence. They believe that every natural element is inhabited by deities or ancestral spirits, and thus must be treated with reverence. For example, *Cāribhāi* (a deity who is associated with rain), *Bāghdeo* (the forest deity), *Bodolmāji* (the ancestor deity), *Furimasar* (the deity of power or Surya), *Chaari Bhai Chari Kora* (a series of deities of fertility and agriculture), *Bāuli* (deity of birds, animals and insects) etc., are worshipped to maintain ecological balance and community welfare. Therefore, the traditional beliefs and rituals reflect a strong bond with nature and emphasize the protection of natural resources. The Tiwa community follows a continuous mode of natural seasonal cycles for sustainable living. It upholds traditional practices such as showing seeds, harvesting, fishing and gathering herbs. These practices illustrate a close relationship between humans, nature and religious beliefs. For example, since agriculture is the main occupation of the Tiwa people so they observe three main ceremonies at different seasons of the year and offer pujas to various deities. "At first they observe *Jong khong puja* and before this puja is observed, nobody should go to the fields for cultivation. Then they observe *aarkura or aarkota* festivat after which the jungles are cut and cleaned and made ready for cultivation. In the third phase they perform *Lakhshmi puja*" (Ibid). These rituals are symbols to invoke fertility and agricultural prosperity, expressing gratitude to natural deities.

'Deo-Seva' is another ritual performed every year, when new areca nuts are ready to eat. Without performing this ritual, no one can eat beetle nuts for the coming year (Baruah 1989). Similarly, as forests are considered an essential part of life, providing vegetables, wood and other resources. The Tiwa people offers prayers to *Chaari Bhai Chari Kora Devota* before cutting bamboo and trees, as he is believed to be their creator. It is only after observing the *Langkhun and Khaaplangrawane* pujas that trees, bamboo, and other materials are accessed (Baruah 2024; Thakur 1985). Again, *Bāghdeo* is regarded as the forest deity and a section of the Tiwa people worships him annually. According to Anil Kumar Boruah, "The tiger is believed as king of the forest by the *Lālungs* even today and as such they believe that only by offering deity to tiger they can get rid of the attack of the tiger and cut the thatch peacefully" (Baruah 1989). These rites and rituals of worshipping natural resources reflect a worldview that promotes the protection of plants and wildlife, while also regulating resource use to ensure their long-term sustainability. The preservation of some sacred sites, trees and forests as abodes of spirits indicates conservation through cultural beliefs emphasizing the moral obligation to protect ecological integrity. This spiritual ecology ensures that nature is both revered and preserved. Again, the taboos such as seasonal restrictions on using natural resources, limitations on the overexploitation of forest resources, illustrate how cultural norms function as informal environmental laws.

Oral tradition plays an important role in the Tiwa worldview. As they don't have any written religious scriptures so depending on folk songs, folk tales, myths they express their worldviews and connect with nature. For example, whenever the crops are affected by drought, the Tiwa people think that the God of rain stops raining, being displeased with them. Then, the youths of some villages go from house to house and start singing a song known as *'Nokā kit'* (welcome rain song). "This folk song is sing and danced in every house with musical instruments and in a specific melodious tune. In this song one special music is taken as an accompaniment and it sounds like roaring and thunder from the expectant sky" (Baruah 1989). The people of the Tiwa community still believe that with this folk song, they can invite rain. This depicts the unity between humans and nature through cultural belief. Therefore, the Tiwa worldview is not only a set of beliefs but a living philosophy that manifests in daily practices, rituals, and community life. It shows that tribals are responsible

for preserving and maintaining traditional knowledge as well as the environmental cycle. In this way, they consider themselves as a part of nature; interconnected with nature and live in harmony.

Conclusion

The Tiwa tribe of Assam exemplifies how tribal philosophy, rooted in an eco-centric worldview, promotes biodiversity conservation and sustainable livelihood. Their spiritual beliefs, rituals, taboos, and traditional practices regulate the use of natural resources and maintain ecological balance. Through organic agriculture, community-based resource management, and oral transmission of ecological knowledge, they ensure both environmental sustainability and cultural continuity. In the face of modern ecological crises, the Tiwa worldview offers valuable insights, showing that harmony with nature and sustainable living are deeply interconnected. Integration of such indigenous knowledge into contemporary development strategies can contribute to a more sustainable and balanced future.

References

Baruah, Anil Kumar (1989): The Lalungs (Tiwas), Guwahati: Directorate of Tribal Research Institute, Assam.

Baruah, Bandana (2024): Society, Economy Religion and Festivals of Tiwa in Assam, Delhi: Kalpaz Publications.

Deuri, Maneswar (2005): Tiwa (Lalung) Sanskritik Shabdakosh, Morigaon: Himadri offset.

Deuri, Maneswar. (1997). Tiwa Sokolor Chaamaadi. Morigaon

Kakati, Dhanada (2019): Religious beliefs and practices of the tiwas of assam a study. Gauhati University, Shodhganga: a reservoir of Indian theses @ INFLIBNET http://hdl.handle.net/10603/236608

Mbiti, S. John (1970): African Religions and Philosophy, New York: Anchor Books.

Nath, Nabaprasad and Dewri, Papori (2023): "Gandhian Philosophy of Self-Sufficiency and Livelihood of the Tiwa Tribe: A Study", Man and Society, Vol. XXI, pp 111-123. https://www.icssrnerc.org/wp-content/uploads/2023-Man-Society-Summer.pdf

Nath, P., Das, M.R., & Bhuyan, S. I. (2020): "Traditional Knowledge on Medicinal Plants Used by Tiwa Ethnic Community, North East India", Indian J. Applied & Pure Biology, Vol. 35, No 2, pp145-149.

https://www.biology-journal.org/fulltext/v35i2/ijapb35-2-6.pdf

Saikia, Debashree (2023): Natural resource management and indigenous knowledge a study of gender and development implications among the Tiwas of Assam. Jawaharlal Nehru University, Shodhganga: a reservoir of Indian theses @ INFLIBNET. http://hdl.handle.net/10603/577187

Sharma Thakur, G.C (1985): The Lalungs (Tiwas), Guwahati: White Lotus Press.

Xalxo, P. Roshan (2021): "Tribal Philosophy: Fusion of Tradition and Modernity", (n.d.), pp 203-212. https://philpapers.org/archive/XALTP.pdf

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Exploring Research Trends in Livelihood Vulnerability: An Outcome of Climate Variability

Raihan Ahmed[1*] and Syeda Fahima Shahnaz Sultana[2]

Accepted : 20 June, 2026

Abstract

Disasters have become more frequent and have a greater impact on people's quality of life due to climate variability. As a result, livelihood risk assessment assumes more significance for comprehending the connections between disasters caused by climate variability and patterns of livelihood. This study makes an effort to identify knowledge gaps, look at research trends, and make recommendations for the future. From 1999 to 2021, the study initially gathered 180 papers from the Google Scholar and Web of Science. These publications' descriptive and thematic qualities were examined in order to find the gaps between livelihood vulnerability and climate variability and to make recommendations for further research. The majority of the researches were carried out locally

*Correspondence :
Email: raihan.nc2021@gmail.com

[1]Department of Geography, Nagaon University, Nagaon, Assam-782001
[2] Department of Geography, North Gauhati College, Guwahati, Assam-781101

Published offline : 7 August

and regionally, where the agriculture sector predominates over other sectors, according to the findings. There is little cross-scale interaction since there is little interdisciplinary coordination on the topic. Geographically, the plains were the subject of more investigations. Mountain ranges and coastal locations should be the focus of future research. In such ecosystems, forest, aquaculture, and dairy farming should be given precedence. In the case of Indian sub-continent, study included India, Bangladesh, Bhutan, Pakistan, and Nepal. The Himalayas accounted for a quarter of the vulnerability studies and the coastal region has a half percentage. A little study has conducted in the interior mainland. For the purpose of assessing livelihood vulnerability, empirical research using an interdisciplinary approach must be conducted.

Keywords Livelihood; Climate variability; Research trends; Vulnerability

Introduction

Natural disasters brought on by climate variability have had a significant negative impact on people's lives, livelihoods, and property (Kumari et al., 2022; Rehman et al., 2022; Masroor et al., 2020; IPCC, 2014; Hinkel, 2011). Such catastrophes have a greater impact on communities that depend on resources from nature (IPCC, 2014; Deressa et al., 2009). A increasing concern is also present that the rapidly changing climate has had a negative impact on the people working in the primary economic sectors of the economy such as agriculture, fisheries and forestry (Cutter et al., 2009; Deressa et al., 2009; O'Brien et al., 2004). Many researchers have conceptualized vulnerability in areas like political ecology, natural hazards, food security and sustainable livelihoods (Wisner et al., 2014; Cutter et al., 2012; Cutter, 1996; Chambers & Conway, 1992). Many researchers created their own definition of vulnerability, always mentioning issues related to livelihood (Turner et al., 2003; Folke et al., 2002; Watts & Bohle, 1993; Liverman, 1990; White, 1986; Sen, 1982).

By way of Article 4.4 of the UN Framework Convention, developed nations are required to help less developed nations pay for the costs of adapting to adverse effects of climate change (United Nations, 1992). Following this convention, numerous researchers (Hulme, 2016; Pandey & Jha, 2012; Hinkel, 2011; Hahn et al., 2009; Jones & Thornton, 2009) have concentrated on vulnerability at different scales. In its fifth assessment report, the Intergovernmental Panel on Climate

Change (IPCC) predicted that by the end of the 20th century, the global sea level will be 1 m higher than it had been the previous two millennia. According to the report, there will be significant changes in the ecosystem worldwide by 2100, including acidification of ocean, a 59 cm rise in sea level, heavy precipitation, and an increase in air temperature. Low-lying coastal islands, particularly those in Asia's large deltas, are more susceptible to and likely to undergo events like storm surge, coastal erosion, widespread floods and catastrophic cyclones. Nearly a million people have already died as a result of dangers brought on by climate change between 1991 and 2005. (ISDR, 2008). Several researchers have evaluated the climate-induced dangers frequency and the extremeness of weather occurrences (Sahana et al., 2021; Dastagir, 2015; Frich et al., 2002). Asia has been the continent most susceptible to hazards and effects brought on by climate change, followed by North America, Africa, Australia and Europe. The majority of the African countries are affected by hydrological and geophysical disasters, which lead to vulnerability at large scale (Guha-Sapir et al., 2012). Asia, particularly India, is clearly experiencing the significant effects of climate change. India is ranked sixth among the many nations that experience harsh weather conditions (Kreft, S. & Eckstein, D. 2013). In India, deltaic ecosystems are especially more susceptible to climate change and human activities that have an impact on biotic and abiotic communities (Bissett et al., 2013).

The scientific community is becoming more aware of the rising effects of climate change on food security, agricultural production, biodiversity and water balance (Jain et al., 2013). To assess the climate variability impact in a region, current climate data must be available, and its history must be understood. Finding the causes of variability and analyzing its effects on civilization have both benefited by understanding the spatial and temporal evidence of climate variability (Oguntunde et al., 2012).

A livelihood is a way of life that satisfies the minimum needs for a child to receive a basic education, enough food and shelter, good health, and a living wage (Frankenberger et al., 2000). Chambers and Conway (1992) defined livelihood in their earliest attempts. They viewed economic endeavours, capacities, and resources as vital sources of subsistence. A household's ability to support itself depends largely on the material and intangible assets it has (Phelps et al., 2010; Ellis, 2000). Therefore, it is crucial to think about how shocks or pressures will affect the stability of a person's livelihood

(Speranza et al., 2014). Any household that is unable to handle shocks and uncertainties is said to be vulnerable to their livelihood (Hahn et al., 2009). The addition of physical and socio-economic components by the Intergovernmental Panel on Climate Change broadens and strengthens the idea of livelihood vulnerability. Exposure, sensitivity, and capacity for adaptation are the three factors that determine vulnerability (IPCC, 2007). Since, it is affected by the socioeconomic circumstances of the population, social network, location and adaptive techniques.

On a temporal scale, climate change and fluctuation have had an impact on diverse geographical regions' livelihoods. By 2100, prediction was made that an increase in temperature of 1.5°C will cause 29%–43% of the glaciers in Asia to melt. Extreme climatic occurrences like floods and droughts that have an impact on livelihoods will result from this process (Kraaijenbrink et al., 2017). According to the International Development Research Centre, Climate variability in African semi-arid parts would have a significant impact on agricultural livelihoods and livestock sectors (IDRC, 2020). Populations that depend on snowmelt glacier may suffer serious effects as a result of the recurring change in water accessibility and for their livelihoods. Study by Brown et al. (2018) looked at the effects of rising temperatures on the protected areas in the deltaic region of Bangladesh and predicted that by 2300, temperatures would have risen by 1.5–3°C. Infrastructure, agriculture, and fisheries will all be impacted by this rise in temperature in the area.

Reviewing climate change vulnerability has been attempted in the past (Singh et al., 2017; Berrang-Ford et al., 2015). However, the available literature places less attention on assessing livelihood risk in a changing climate. Consequently, this research thoroughly examines the vulnerability of livelihood to climate fluctuation. The primary goal of the study is to examine the trends of research in livelihood vulnerability caused by climate variability. This review study also analyzes the knowledge gaps in the analysis of livelihood vulnerability and suggest a comprehensive strategy for future research.

Methods

The systematic review of livelihood vulnerability was conducted using synthesis and meta-analytical techniques. The information was gathered from Google Scholar and Web of Science spans the years 1999 to 2021. To preserve the caliber of the analysis, the journals included in Scopus, the Social Science Citation Index, and the

Science Citation Index were chosen. "Livelihood, vulnerability, climate change and climate variability" were the keywords chosen for this review. The papers were chosen according to the inclusion and exclusion criteria (Table 1). The publications that examined climate variability and livelihood vulnerability were included in the review. There were 180 papers downloaded in total. 24 of these papers were rejected because they weren't deemed pertinent to the review. The chosen articles underwent a detailed analysis to look at the paradigm shift in the conception of vulnerability, analytical methodology, spatial distribution of studies, causes of vulnerability, and livelihood sectors.

Table 1: Article Selection Criteria for the Study

Article selection criteria	Included	Excluded
Publication date	Articles published between January 1999 and / December 2021	Articles published before 1990 or after December 2021
Document type	Peer-reviewed articles	Grey literature, book chapters, conference proceedings, reports, notes
Study region	World with special reference to Indian Sub-continent (India, Bangladesh, Bhutan, Pakistan, and Nepal)	-
Language	English language only	Articles in other languages
Theme	Articles conducted on livelihood vulnerability, including social, economic, and environmental vulnerabilities.	Articles not explicitly related to / vulnerabilities
Database	Google Scholar and / Web of Science	Articles not available in these / comprehensive databases

Source : Authors' research from various sources

Global Research Trends

Between 1999 and 2011, only 20 publications on the susceptibility of livelihoods to climate variability were published. However, further study on livelihood susceptibility to climate change was conducted following the release of the report by IPCC (2007) and Hahn et al. (2009) creation of the livelihood vulnerability index (LVI). Academics from numerous academic fields have caught the interest of LVI and LVI-IPCC evaluation. In the past ten years, there has been a significant rise under research on climate induced livelihood vulnerability assessment in various climate change scenarios (Figure 1).

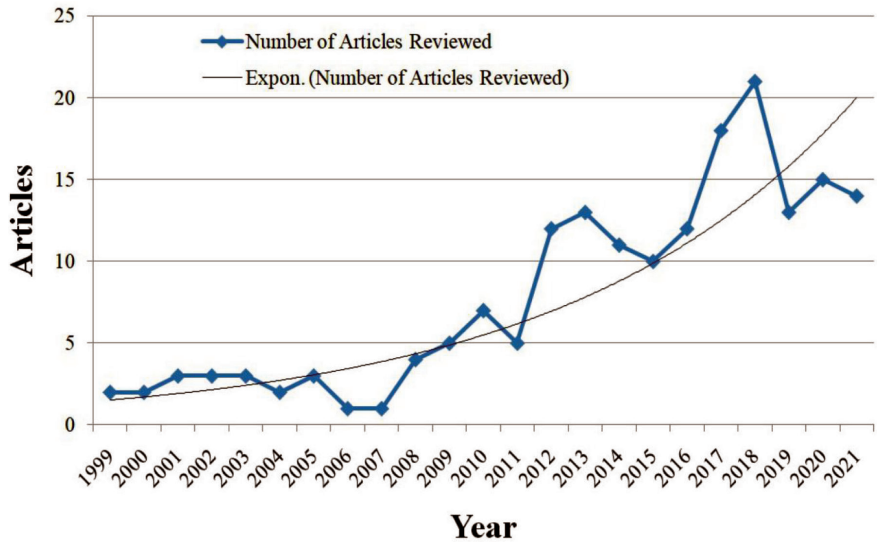

Figure 1: Global Research Trends during 1999-2021 in Livelihood Vulnerability and Climate Variability. *Source : Authors' illustration*

To examine the various knowledge areas in the assessment of forest vulnerability, keywords were extracted. In all, 549 keywords were found in the database of documents that had been collected. Once all the keywords had been examined a frequency table was produced. the recurring ones. In the end, 425 keywords were used for additional investigation. The most frequently used terms in those publications were "climate change", "climate variability", "livelihood", "agricultural" and "fishing" (Figure 2). The analysis of forest vulnerability involved extracting and examining a comprehensive set of keywords from a database of collected documents. Initially, 549 keywords were

identified, reflecting a broad spectrum of topics related to the assessment of forest vulnerability. After a thorough review, 425 of these keywords were selected for more detailed investigation based on their relevance and recurrence across the literature. This refinement allowed for a focused exploration of the most significant themes and factors influencing forest vulnerability.

Among the most frequently occurring keywords in the analyzed publications were "climate change," "climate variability," "livelihood," "agricultural," and "fishing." These terms highlight the multidisciplinary nature of forest vulnerability assessments, encompassing environmental, socio-economic, and livelihood dimensions. The prominence of climate-related terms underscores the critical role of changing climatic conditions in shaping forest ecosystems' susceptibility, while the inclusion of livelihood and resource-based activities such as agriculture and fishing indicates the interconnectedness between forest health and human communities dependent on these ecosystems (Figure 2). This keyword frequency analysis provides a foundational understanding of the key areas driving research and policy discussions in forest vulnerability.

In the assessment of livelihood vulnerability, Asia dominated, followed by Africa, the American continents and Oceania. The majority of research was conducted in developing nations like India, Bangladesh, China, Ghana, Ethiopia and Nepal. Local level (45.31%), regional level (33.67%), national level (10.8%), transnational level (6.33%), and global level (3.33%) were where they were mostly conducted.

Figure 2 : Word Cloud of most used Keywords in Reviewed Literature. *Source : Authors' illustration*

The agricultural sector has received the most attention in studies (71.2%), followed by fisheries (14.9%), forestry (7.8%) and pastoralist (5.4%) (Figure 3a). Mountains (24.7%), coastal regions (10.6%), Forest (5.1%) and Wetland (3.1%) were followed by plain regions (57.9%) respectively (Figure 3b). According to the publications reviewed, agriculture and pastoralism predominate in mountainous areas. The coastal regions were mostly concentrated on agriculture and fishing. 30% of the papers that were assessed specifically addressed the vulnerability of livelihoods due to drought. In about 30% of studies, extreme events have been taken into account when analyzing livelihood vulnerability. However, cyclones received little attention. The industry of livelihood that is most susceptible to the whims of nature has been discovered to be agriculture.The agricultural sector dominates the focus of vulnerability studies, accounting for over 70% of the research attention, followed by fisheries, forestry, and pastoralism. This distribution reflects the critical role agriculture plays as a livelihood source, especially in regions prone to environmental stressors. Geographically, the majority of these studies concentrate on plain regions (57.9%), with significant attention also given to mountainous areas (24.7%) and coastal zones (10.6%). The prevalence of agriculture and pastoralism in mountainous regions highlights the reliance on these sectors in less accessible terrains, while coastal studies tend to emphasize agriculture and fishing, underscoring the interdependence between livelihoods and local ecosystems.

A considerable portion of the literature (approximately 30%) specifically addresses livelihood vulnerability in the context of drought, indicating a strong research emphasis on water scarcity and its impacts. Extreme weather events feature in about the same proportion of studies, though cyclones remain underexplored despite their potential for severe disruption. This gap suggests a need for more focused research on cyclone impacts to better inform resilience strategies. Overall, agriculture emerges as the livelihood most susceptible to natural hazards, reflecting its exposure to climatic variability and extreme events, which threaten food security and economic stability in vulnerable communities.

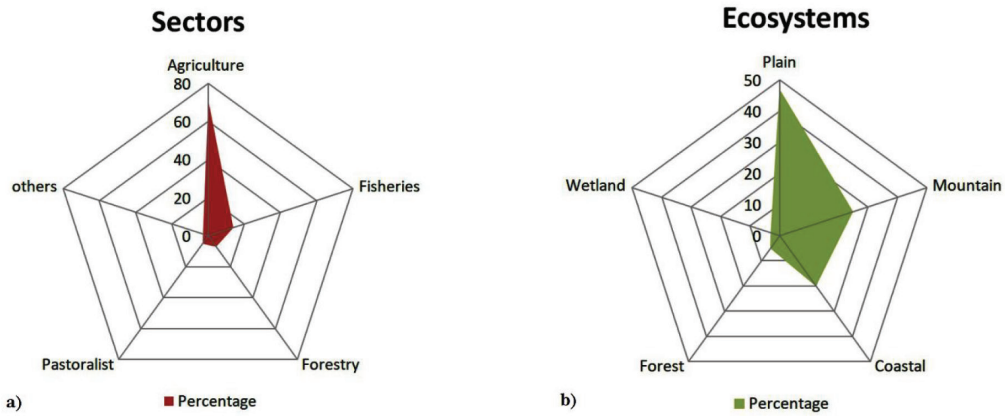

Figure 3 : Climate Variability Induced a) Sector-Wise Livelihood Vulnerability Research and b) Ecosystem-Wise Livelihood Vulnerability Research. *Source : Authors' illustration*

Scenario in Indian Sub-continent

The reviewed publications reveal a diverse range of objectives in vulnerability studies, with a predominant focus on assessing the vulnerability of subsistence means, which accounts for 37.1% of the papers. This emphasis highlights the critical concern for livelihoods directly impacted by environmental and socio-economic changes. Environmental vulnerability follows at 25.7%, underscoring the importance of understanding ecosystem fragility and resource depletion. Other notable objectives include documenting changes (15.2%), evaluating human condition vulnerability (13.3%), noting interventions (4.7%), and assessing infrastructure vulnerability (3.8%). The Indian Sub-continent emerges as a focal region, with climate change identified as the primary driver of vulnerability in 36 articles. This region experiences a higher rate of warming compared to global averages, which exacerbates its susceptibility. Additional factors contributing to vulnerability include land use and land cover changes, glacial lake formation, coastal region risks, flooding, poverty, and population growth, all of which compound the region's overall vulnerability profile.

Moreover, the majority (53%) of the studies incorporate multiple vulnerability types, reflecting the interconnected nature of vulnerabilities in socio-ecological systems. Economic and ecological fragilities are prominently featured, comprising 21% and 23% of the reviewed literature, respectively,

indicating that financial stability and environmental health are critical components of vulnerability assessments. Social vulnerability, while less frequently addressed, remains an important dimension, highlighting the need for more comprehensive approaches that integrate social factors such as community resilience, equity, and access to resources. Together, these findings emphasize the multifaceted nature of vulnerability in the Indian Sub-continent and the necessity for interdisciplinary research to develop effective adaptation and mitigation strategies tailored to this region's unique challenges.

Way Forwards

To comprehensively analyze future livelihood vulnerability, it is important to consider the components of sensitivity, exposure, and adaptation. These elements are vital for evaluating vulnerability in livelihoods. In the context of a rapidly changing climate, selecting site-specific indicators for various types of susceptibility is crucial when assessing livelihood vulnerability. For this analysis, meteorological factors, natural disasters, extreme events, and population demographics can serve as suitable indicators. There remains ample opportunity for further research in areas such as forestry, fisheries, pastoralism, dairying, and animal husbandry. The study also focused on the secondary and tertiary sectors, as they hold significant potential for employment.

In the majority of assessments of livelihood vulnerability, adaptive capacity has received less attention. Assessing livelihood vulnerability requires careful consideration of socioeconomic factors, methods for diversifying sources of income, and health-related issues. Collaboration at the national, transnational, and international levels should be prioritized when examining how climatic variability affects way of life. These researches can recommend measures to reduce the effect of climatic variability on livelihood while also being able to suggest meaningful action. For the assessment of livelihood vulnerability, the function of various institutions and local stakeholders has increasing significance. Geospatial technologies and knowledge systems are important instruments for evaluating livelihood assessments.

Geospatial technology can be used to gather data about the physical environment, natural resources, and climate conditions. Such inventories can aid in a thorough analysis of livelihood vulnerability. Finally, it is important to take into account the assessment of long-term livelihood vulnerability. In longitudinal research intended to track livelihood vulnerability, observations of

repeated man-environment interaction should be made over an extended period of time.

Conclusion

This study conducts a comprehensive review of the literature on the vulnerability of livelihoods to climate variability, with the objectives of defining the concept, identifying trends, addressing information gaps, and proposing a framework for future research. Despite extensive research on various aspects of livelihood vulnerability, significant knowledge gaps persist regarding spatial scales and patterns of livelihoods across diverse ecosystems and economies. To develop a composite livelihood vulnerability assessment scenario, the study emphasizes the roles of institutions, policies, perceptions, and knowledge systems. The susceptibility of the Indian Subcontinent has been the focus of varying levels of research, with regions such as the southern slopes of the Himalayas, coastal areas, and plains in India, Bangladesh, Bhutan, Nepal, and Pakistan identified as particularly vulnerable due to high population density. The paucity of vulnerability studies in these regions contributes to a substantial knowledge gap concerning their vulnerabilities. We argue that this approach may be applicable to other geographical areas seeking to analyze the livelihood risks faced by different socioeconomic groups across spatial scales in a changing environment.

References

Barros, V. R., Field, C. B., Dokken, D. J., Mastrandrea, M. D., Mach, K. J., Bilir, T. E., … White, L. L. (2014). *Climate change 2014: Impacts, adaptation, and vulnerability. Part B: Regional aspects: Working group II contribution to the fifth assessment report of the intergovernmental panel on climate change* (pp. 1–1820). Cambridge University Press.

Berrang-Ford, L., Pearce, T., & Ford, J. D. (2015). Systematic review approaches for climate change adaptation research. *Regional Environmental Change, 15*(5), 755–769.

Biemans, H., Siderius, C., Lutz, A. F., Nepal, S., Ahmad, B., Hassan, T., … Immerzeel, W. W. (2019). Importance of snow and glacier meltwater for agriculture on the Indo-Gangetic Plain. *Nature Sustainability, 2*(7), 594–601.

Bissett, A., Brown, M. V., Siciliano, S. D., & Thrall, P. H. (2013).

Microbial community responses to anthropogenically induced environmental change: Towards a systems approach. *Ecology Letters, 16,* 128–139.

Chambers, R., & Conway, G. (1992). *Sustainable rural livelihoods: Practical concepts for the 21st century.* Institute of Development Studies.

Cutter, S. L. (1996). Vulnerability to environmental hazards. *Progress in Human Geography, 20*(4), 529–539.

Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2012). Social vulnerability to environmental *hazards. In Hazards, vulnerability and environmental justice* (pp. 143–160). Routledge.

Cutter, S. L., Emrich, C. T., Webb, J. J., & Morath, D. (2009). Social vulnerability to climate variability hazards: A review of the literature. *Final report to Oxfam America, 5,* 1–44.

Das, T., Pal, A. K., Chakraborty, S. K., Manush, S. M., Chatterjee, N., & Mukherjee, S. C. (2004). Thermal tolerance and oxygen consumption of Indian major carps acclimated to four temperatures. *Journal of Thermal Biology, 29*(3), 157–163.

Dastagir, M. R. (2015). Modeling recent climate change induced extreme events in Bangladesh: A review. *Weather and Climate Extremes, 7,* 49–60.

Deressa, T. T., Hassan, R. M., Ringler, C., Alemu, T., & Yesuf, M. (2009). Determinants of farmers' choice of adaptation methods to climate change in the Nile Basin of Ethiopia. *Global Environmental Change, 19*(2), 248–255.

Ellis, F. (2000). The determinants of rural livelihood diversification in developing countries. *Journal of Agricultural Economics, 51*(2), 289–302.

Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C. S., & Walker, B. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. *AMBIO,* 31(5), 437–440.

Frankenberger, T., Drinkwater, M., & Maxwell, D. (2000). *Operationalizing household livelihood security: A holistic approach for addressing poverty and vulnerability.* CARE.

Frich, P., Alexander, L. V., Della-Marta,

P. M., Gleason, B., Haylock, M., Tank, A. K., & Peterson, T. (2002). Observed coherent changes in climatic extremes during the second half of the twentieth century. *Climate Research, 19*(3), 193–212.

Guha-Sapir, D., Vos, F., Below, R., & Ponserre, S. (2012). *Annual disaster statistical review 2011: The numbers and trends.* Centre for Research on the Epidemiology of Disasters.

Hahn, M. B., Riederer, A. M., & Foster, S. O. (2009). The livelihood vulnerability index: A pragmatic approach to assessing risks from climate variability and change—A case study in Mozambique. *Global Environmental Change,* 19(1), 74–88.

Hinkel, J. (2011). Indicators of vulnerability and adaptive capacity: Towards a clarification of the science–policy interface. *Global Environmental Change, 21*(1), 198–208.

Hulme, M. (2016). 1.5°C and climate research after the Paris Agreement. *Nature Climate Change,* 6(3), 222–224.

International Development Research Centre (IDRC). (2020). *Collaborating for adaptation: Findings and outcomes of a research initiative across Africa and Asia.*

IPCC. (2007). Summary for policymakers. In M. L. Parry et al. (Eds.), Climate change 2007: Impacts, adaptation and vulnerability (pp. 7–22). Cambridge University Press.

IPCC. (2014). Summary for policymakers. In C. B. Field et al. (Eds.), Climate change 2014: *Impacts, adaptation, and vulnerability* (pp. 1–32). Cambridge University Press.

ISDR. (2008). *Climate change and disaster risk reduction.* https://www.wmo.int/pages/dra/vcp/documents/7607_Climate-Change-DRR.pdf

Jain, S. K., Kumar, V., & Saharia, M. (2013). Analysis of rainfall and temperature trends in northeast India. *International Journal of Climatology, 33*(4), 968–978.

Jones, P. G., & Thornton, P. K. (2009). Croppers to livestock keepers: Livelihood transitions to 2050 in Africa due to climate change. *Environmental Science & Policy, 12*(4), 427–437.

Kraaijenbrink, P. D., Bierkens, M. F. P., Lutz, A. F., & Immerzeel, W.

W. (2017). Impact of a global temperature rise of 1.5°C on Asia's glaciers. *Nature, 549*(7671), 257–260.

Kreft, S., & Eckstein, D. (2013). *Global climate risk index 2014.*

Kumari, G., Sajjad, H., Rahaman, M. H., Masroor, M., Ahmed, R., & Sahana, M. (2022). Climate variability induced livelihood vulnerability: A systematic review and future prospects. *Area.*

Liverman, D. M. (1990). Vulnerability to global environmental change. In *Understanding global environmental change* (pp. 27–44).

Masroor, M., Rehman, S., Avtar, R., Sahana, M., Ahmed, R., & Sajjad, H. (2020). Exploring climate variability and its impact on drought occurrence. *Weather and Climate Extremes, 30,* 100277.

O'Brien, K., Leichenko, R., Kelkar, U., Venema, H., Aandahl, G., Tompkins, H., … West, J. (2004). Mapping vulnerability to multiple stressors. *Global Environmental Change, 14*(4), 303–313.

Oguntunde, P. G., Abiodun, B. J., & Lischeid, G. (2012). Spatial and temporal temperature trends in Nigeria. *Meteorology and Atmospheric Physics, 118*(1), 95–105.

Pandey, R., & Jha, S. (2012). Climate vulnerability index. *Mitigation and Adaptation Strategies for Global Change, 17*(5), 487–506.

Phelps, J., Webb, E. L., & Agrawal, A. (2010). Does REDD+ threaten to recentralize forest governance? *Science, 328*(5976), 312–313.

Rehman, S., Sajjad, H., Masroor, M., Rahaman, M. H., Ahmed, R., & Sahana, M. (2022). Assessment of climate variability in Bhagirathi sub-basin. *Acta Geophysica, 70*(1), 445–463.

Sahana, M., Rehman, S., Ahmed, R., & Sajjad, H. (2021). Analyzing climate variability in Sundarban Biosphere Reserve. *Environment, Development and Sustainability, 23*(2), 2465–2492.

Sen, A. (1982). *Poverty and famines: An essay on entitlement and deprivation.* Oxford University Press.

Singh, C., Deshpande, T., & Basu, R. (2017). How do we assess vulnerability to climate change in India? *Regional Environmental Change,* 17(2), 527–538.

Speranza, C. I., Wiesmann, U., & Rist, S. (2014). Indicator framework for livelihood resilience. *Global Environmental Change, 28,* 109–119.

Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., … Schiller, A. (2003). A framework for vulnerability analysis. *Proceedings of the National Academy of Sciences, 100*(14), 8074–8079.

United Nations. (1992). *United Nations framework convention on climate change.* https://unfccc.int

Watts, M. J., & Bohle, H. G. (1993). The space of vulnerability. *Progress in Human Geography,* 17(1), 43–67.

White, G. F. (1986). *Geography, resources and environment* (Vol. 1). University of Chicago Press.

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2014). *At risk : Natural hazards, people's vulnerability and disasters.* Routledge.

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Balancing People and Resources: A Carrying Capacity Analysis of Assam's Districts for Sustainable Development

Pahi Sharma[1] and Atrayee Baruah[2*]

Accepted : 15 June, 2026

Abstract

This study endeavors to assess the sustainable population capacity of each district in Assam, utilizing the 2011 district boundaries and official data, without exhausting natural resources. The study integrate straightforward metrics of land and water availability, including cultivable land, forest cover, irrigation, population counts, and land use intensity indicators, to construct a singular, reproducible carrying-capacity score for each district. The findings reveal distinct variations across Assam. The districts within the Brahmaputra valley experience significant pressure due to the high population density relative to limited farmland, whereas the hill and forest districts, such as Karbi Anglong and Dima Hasao, have lower population densities but possess fragile ecosystems that are susceptible to stress.

*Correspondence :
Email: baruahatrayee3@gmail.com

[1] Department of Geography, Nagaon University, Nagaon, Assam-782001
[2] Department of Geography, Gauhati University, Guwahati, Assam-781014

Published offline : 7 August

Several districts appear to be operating beyond conservative sustainability thresholds, indicating that current land use and population levels may jeopardize food security and environmental health unless there are changes in management and infrastructure. The paper advocates for district-specific planning, investment in resilient agricultural and water systems, and the application of carrying-capacity measures as a practical policy tool, always reported with uncertainty to ensure planners comprehend the limitations of the estimates.

Keywords Sustainable population capacity; Population carrying capacity; Land and water availability; Environmental and food security

Introduction

Carrying capacity fundamentally represents the balance between a population and the natural resources available to sustain it over time(Sharma et al., 2024). This concept integrates multiple environmental factors such as soil fertility, water availability, and climatic conditions, which collectively determine the limits within which an ecosystem can function without degradation(Wang & Liu, 2019). Beyond natural constraints, human interventions particularly the efficiency of resource management play a critical role in modulating carrying capacity (Lal, 2012). Effective management practices can enhance the sustainable use of resources, thereby potentially increasing the population-supporting potential of a region. Conversely, poor management or overexploitation can reduce carrying capacity, leading to resource depletion and environmental decline (Grimble, 1996)(L. Wang & Liu, 2019).

Furthermore, carrying capacity encompasses both the supportive and assimilative capacities of an ecosystem, reflecting its ability not only to provide resources but also to absorb wastes and maintain ecological balance. This dual aspect is essential for achieving sustainable development goals, where improving quality of life must be balanced against preserving environmental integrity(Aktymbayeva et al., 2023; Gulishengmu et al., 2023). The concept underscores the urgency of aligning human population growth and consumption patterns with the regenerative limits of natural systems, especially in the context of global challenges such as resource depletion and environmental pollution (Lane, 2010; Khanna et al., 1999). Research in coordinated development emphasizes that maintaining this equilibrium is vital for long-term ecological health and equitable resource distribution,

highlighting carrying capacity as a foundational principle for environmental planning and policy-making (Weihua et al., 1992)(Y. Wang et al., 2019; Weitzman & Filgueira, 2019).

By 2050, the demographic pressures on India will intensify significantly, with its population projected to reach between 1.64 and 1.74 billion, contributing to the global population milestone of 9 billion(Lam, 2011). This rapid growth is occurring within a context of stark resource limitations: India possesses only 2.3% of the world's land and 4.2% of its freshwater resources, resulting in a per capita resource availability that is four to six times lower than the global average (Ghosh S.P 2012)(Dhakal et al., 2022). As urbanization accelerates, with approximately 36% of the population residing in cities, the resulting influx of migrants has led to severe saturation of urban infrastructure and natural resources(Kumari et al., 2024). This urban pressure exacerbates the overexploitation of land, water, energy, and biological resources, underscoring the urgent need to accurately assess the population carrying capacity of urban centers to prevent irreversible environmental degradation and socio-economic stress (Tailor et al., 2024).

India's economy, environment, and society are intricately linked through the sustainable management of its natural resources. However, the combined effects of rapid industrialization, urban sprawl, intensified agriculture, and population growth are increasingly outpacing the regenerative capacity of many ecosystems(Bhattacharyya et al., 2015, 2023). This imbalance threatens the long-term viability of regional environments and the livelihoods dependent on them. Recognizing these challenges, Indian policy frameworks have evolved over time, with the 1990s National Commission on Agriculture and Planning Commission highlighting the risks of unchecked growth(Chettry & Surawar, 2020; Hatab et al., 2021). More recently, the NITI Aayog's post-2015 initiative on the "Carrying Capacity of Major Cities and River Basins" integrates this concept within the global agenda for sustainable development, particularly aligning with SDG 12 (Sustainable Consumption and Production) and SDG 13 (Climate Action)(Eisenmenger et al., 2020; Vaidya & Chatterji, 2019). This policy focus aims to identify ecological stress zones and guide strategic interventions that balance development needs with environmental sustainability, ensuring that India's growth trajectory remains resilient and inclusive.

The study undertakes a comprehensive evaluation of Assam's

district-level resource base by systematically analyzing three critical categories: mineral resources, water resources, and arable land. Mineral resources include key commodities such as oil, natural gas, coal, and limestone, which are vital for the region's economic development and energy security. Water resources are examined through multiple dimensions rainfall patterns, surface and groundwater availability, and irrigation infrastructure providing a holistic view of water accessibility and sustainability across districts. The assessment of arable land focuses on both the extent of cultivable land and cropping intensity, reflecting agricultural productivity and land-use efficiency. By compiling detailed district-wise data for each resource type, the study facilitates a granular comparison of resource endowments relative to the population size, enabling identification of districts where resource availability may be insufficient to meet current or future demands.

Furthermore, the study aims to identify districts exhibiting signs of resource stress or overexploitation by analyzing the interplay between population density and natural resource capacity. This involves detecting patterns where resource consumption potentially exceeds sustainable thresholds, signaling environmental or socio-economic vulnerabilities. Trends emerging from this analysis will inform projections of the human carrying capacity at the district level, offering valuable insights for regional planning and resource management. By highlighting areas under pressure, the findings can guide targeted interventions to balance development needs with conservation priorities, ensuring long-term sustainability and resilience of Assam's natural resource base.

Study Area

Assam is situated in northeastern India, south of the Himalayas. The Brahmaputra River, flowing from west to east, divides the state, which is also drained by its tributaries and the southern Barak River. The topography of Assam features expansive alluvial plains on both the north and south banks of the Brahmaputra, the smaller Barak Valley in the south, and hilly districts like Karbi Anglong and Dima Hasao in the central region. Assam's 35 districts are organized into five divisions. Climatically, the state experiences some of India's highest rainfall, reaching up to 2500–3000 mm in certain areas, but it also faces severe annual floods that impact land usability (Das et al., 2024; Mirza, 2010). The soils are generally fertile, supporting intensive agriculture such as tea and rice. However, rapid population growth,

with Assam's population increasing from approximately 26.6 million to about 31.2 million between 2001 and 2011, puts pressure on resources. For instance, Assam's population density in 2011 was around 398 people per square kilometer, significantly above the national average(Joshi et al., 2007). Major mineral resources include petroleum and natural gas Assam was the site of Asia's first oil drilling along with coal and limestone in some districts. Tea estates cover large areas of land. Water resources consist of perennial river flows, extensive floodplain wetlands, and limited irrigation infrastructure.

Methods

The study employs secondary data from three principal sources: the Census of India (2011) for district-level population, density, and demographic structure; the Directorate of Economics & Statistics, Assam (2023) for data on land use, irrigation, and water resources; and the Directorate of Geology and Mining, Assam for statistics on natural gas production and utilization. Collectively, these datasets furnish a comprehensive foundation for estimating carrying capacity, evaluating population pressure, and analyzing sustainability trends across the districts of Assam.

The methodology adopts a dual-model approach integrating land-based and water-based carrying capacity to assess the sustainability thresholds across the districts of Assam.

General Conceptual Framework

Carrying capacity (CC) refers to the maximum population that an environment can sustain indefinitely without degrading its resource base, a concept rooted in ecological studies (Odum & Barrett, 2005; Rees, 1992). It is operationalized as the ratio of total available resources to per capita resource requirements:

$$CC = R/P_p$$

where CC is the carrying capacity, R is the total available resource, and P_p represents per capita resource requirement.

Sector-Specific Models

The research applies two distinct models to capture the "supportive capacity" of the environment are:

Land-Based Carrying Capacity (CCl)

Land-based carrying capacity is estimated using agricultural production potential and per capita food requirements (Food and Agriculture Organization [FAO], 2003; Bruinsma, 2003). It is expressed as:

$$CC_l = (A \times Y) / C$$

Where, A is arable land (hectares), Y is average yield (kg/ha), and C is

annual per capita food requirement(kg/person/year).

The average yield is assumed to be 2,500 kg/ha, while per capita food requirement is taken as 400 kg/person/year, consistent with FAO-based dietary benchmarks (FAO, 2003; Alexandratos & Bruinsma, 2012).

Water-Based Carrying Capacity (CC_w)

Water-based carrying capacity is determined using renewable freshwater availability and per capita water demand (Falkenmark, 1989; Falkenmark & Widstrand, 1992). It is expressed as:

$$CC_w = W_a / W_p$$

where, Wadenotes total renewable water resources (m^3) and Wp represents per capita water requirement. A threshold of 1,000 m^3/person/year is adopted, which is widely recognized as the minimum level for avoiding water stress (Falkenmark, 1989).

Total Carrying Capacity

The overall carrying capacity is derived by aggregating land-based and water-based capacities to produce a composite indicator of environmental support (UNEP, 2012; Rees, 1992).): The final capacity for each district is the aggregate of both land and water capacities ($CC_t = CC_l + CC_w$)

Stress Evaluation (Population Pressure Index)

To evaluate the extent of pressure on available resources, a Population Pressure Index (PPI) is computed as:

PPI = Actual Population / Carrying Capacity

This index reflects the relationship between population size and resource support capacity (Daily & Ehrlich, 1992; UNEP, 2012).

Based on the calculated values, regions are classified into four categories: Below Capacity (<0.8), Near Equilibrium (0.8–1.0), Stressed (1.0–1.2), and Critical (>1.2), adapted from ecological stress literature (UNEP, 2012; Daily & Ehrlich, 1992).

Results and Discussion

The district-wise evaluation of carrying capacity across Assam reveals notable disparities in the equilibrium between population distribution and resource availability. By integrating land-based and water-based carrying capacity estimates the analysis delineates distinct spatial patterns of sustainability. The Population Pressure Index (PPI), calculated as the ratio of actual population to total carrying capacity, functions as a quantitative indicator of sustainability thresholds. A PPI value exceeding

1.0 indicates that the population has surpassed the sustainable resource limit, thereby signaling ecological strain and potential socio-economic vulnerability.

Regional Patterns of Resource Stress

Districts such as Nagaon (PPI = 3.46), Karimganj (2.19), Cachar (1.55), Barpeta (1.34), and Dhubri (1.52) are situated within a critical stress zone, where demographic growth has surpassed the combined carrying capacity of arable land and renewable water resources. Predominantly located in the Brahmaputra and Barak plains, these districts are characterized by high population densities, fragmented landholdings, and decreasing per capita water availability. This overexploitation of natural resources is consistent with the Malthusian perspective on population-resource imbalance, manifesting as an ecological overshoot that poses a threat to long-term sustainability. In contrast, districts such as Karbi Anglong (PPI = 0.63), Dima Hasao (0.52), Chirang (0.78), and Dhemaji (0.77) exhibit below-capacity or surplus conditions, indicative of sustainable population-resource ratios. These districts, marked by lower population densities and abundant natural resources, offer opportunities for eco-sensitive development. However, given their fragile hill ecosystems, development initiatives should prioritize sustainable forestry, controlled land-use expansion, and biodiversity conservation. Districts such as Dibrugarh (PPI = 1.16), Tinsukia (1.20), Sivasagar (1.14), Nalbari (1.07), and Sonitpur (1.06) fall into a moderately stressed category. Their relative balance between human pressure and resource base suggests potential for achieving dynamic equilibrium through enhanced agricultural efficiency, micro-irrigation technologies, and sustainable industrial practices.

Sustainability Dimensions and Ecological Implications

The carrying capacity model employed in this analysis encapsulates the three fundamental dimensions of sustainability: environmental, economic, and social. Districts that surpass their carrying capacity encounter multifaceted challenges, including environmental degradation, economic stagnation, and social stress. The regions of Lower Assam and Barak Valley exemplify these dynamics, where population growth exceeds the regenerative capabilities of land and water systems. Environmental degradation in these districts manifested through soil fertility loss, groundwater depletion, and deforestation diminishes productivity, thereby perpetuating cycles of poverty and migration. From an

ecological perspective, this imbalance erodes the ecosystems' assimilative capacity, reducing their ability to absorb waste and regenerate resources. The continuation of such trends undermines the principle of strong sustainability, which necessitates the preservation of natural capital for intergenerational equity, as opposed to substituting it with economic or technological capital, as suggested in the concept of weak sustainability.

Energy Sustainability: Insights from Natural Gas Production

Table 1 offers an energy-focused perspective on the sustainability assessment. Between the fiscal years 2008–09 and 2010–11, the total production of natural gas in Assam experienced a modest increase from 2,573 MCM to 2,676 MCM, reflecting operational stability. The proportion of gas flared, indicative of resource inefficiency and emission loss, decreased marginally from 8.01% to 7.08%. Despite Oil India Limited's status as the predominant producer, the ongoing absence of gas reinjection and the persistent flaring of approximately 180 MCM annually underscore inefficiencies in energy management. The internal consumption of natural gas for petroleum operations rose from 430 MCM to 463 MCM, highlighting the state's escalating industrial energy demand. To augment Assam's energy capacity, the implementation of gas recovery, reinjection, and emission mitigation technologies is essential. Furthermore, the integration of renewable energy alternatives such as solar, micro-hydro, and biogas can mitigate the overreliance on fossil resources and align energy systems with sustainable development goals.

Table1: Gross Production of Natural Gas and Quantity of Gas Flared in Assam (In Million Cubic Meter)

Year	Category	Gross / Production	Unavoidable Loss(Gas Flared)	Percentage of Gas Flared over gross Production	Gas used for petroleum mining operation	Net production
2008-2009	Oil / ONGC / C.R.L / Total	2042.62 / 471.28 / 59.33 / 2573.23	158.88 / 45.09 / 2.16 / 206.13	7.78 / 9.56 / 3.64 / 8.01	265.61 / 163.72 / 1.16 / 430.49	1618.13 / 262.47 / 56.01 / 1936.61
2009-2010	Oil / ONGC / C.R.L / Total	2188.96 / 467.2 / 48.01 / 2704.17	162.74 / 33.6 / 1.46 / 197.8	7.43 / 7.19 / 3.04 / 7.31	288.12 / 178.53 / 2.91 / 469.56	1738.1 / 255.07 / 43.64 / 2036.81
2010-2011	Oil / ONGC / C.R.L / Total	2178.07 / 462.24 / 36.5 / 2676	158.89 / 30.79 / 0.08 / 189.76	7.29 / 6.66 / 0.22 / 7.08	291.72 / 169.53 / 2.23 / 463.48	1727.46 / 261.92 / 34.19 / 2023.57

Source: Directorate of Geology and Mining, Assam (2011)

Policy Implications for Sustainable Resource Management

The comparative analysis of land, water, and energy capacities highlights the necessity for an integrated sustainability framework for Assam. Key strategic actions include: promoting watershed management and rainwater harvesting to enhance water-use efficiency; expanding agroforestry and soil conservation programs to improve land productivity; encouraging the adoption of renewable energy in high-stress districts to reduce carbon intensity; implementing population stabilization and spatial planning policies to mitigate demographic pressure; and strengthening data-driven environmental governance for adaptive management(Shehadeh et al., 2024; Subbarayan et al., 2025). Districts with surplus capacity can serve as models of preventive sustainability, emphasizing resource stewardship, community-based forest management, and eco-tourism. Differentiated regional strategies based on carrying capacity align with the concept of territorial sustainability,

which acknowledges spatial variations in ecological resilience(Kuuluvainen et al., 2021; Octavia et al., 2022).

Toward a Resilient Sustainability Framework

The concept of carrying capacity should be perceived as a dynamic equilibrium rather than a static threshold. Sustaining this equilibrium necessitates ongoing evaluation of population dynamics, resource utilization, and ecosystem health. Incorporating carrying capacity thresholds into regional planning can facilitate equitable and ecologically sustainable development(Hsu et al., 2021). Enhancing institutional capacity, investing in environmentally friendly technologies, and fostering local community engagement are critical measures for advancing Assam's overall sustainability. The study ultimately illustrates that augmenting Assam's carrying capacity is achievable through the synergistic application of technological innovation, effective governance, and inclusive resource management. Such an approach can ensure that the state's development remains environmentally sustainable, economically viable, and socially equitable for future generations(Anthony, 2023; Eshbayev et al., 2024).

Future Projection

By 2035, the population of Assam is anticipated to reach approximately 39.5 million, representing a 26% increase from the 2011 Census baseline. This demographic growth will occur within a limited ecological space, thereby intensifying the demand on land, water, and energy resources. In the absence of commensurate improvements in infrastructure and resource efficiency, the state's per capita water availability could decrease by 25%, while arable land per capita may diminish by nearly 22%. These reductions suggest that several districts are likely to surpass their sustainable thresholds, consequently entering states of ecological and economic stress. Spatial modeling based on current carrying capacity trends indicates that the Lower Assam districts including Kamrup Metropolitan, Nagaon, Barpeta, and Dhubri—will remain the most resource-stressed regions. Urban expansion, coupled with population concentration and limited cultivable land, may further diminish local food self-sufficiency and accelerate groundwater depletion. Barak Valley districts such as Karimganj and Cachar are expected to encounter similar challenges, as increasing urbanization and industrial activity intensify competition for agricultural land and

freshwater resources.

In contrast, regions such as Upper Assam and the hill districts of Karbi Anglong, Dima Hasao, Dhemaji, and Lakhimpur are anticipated to maintain relative ecological stability due to their lower population densities and relatively high per capita resource endowments. Nevertheless, their sustainability is contingent upon the effective conservation of forests, wetlands, and mineral reserves. Ineffectively managed development in these districts could result in ecological fragility, soil erosion, and biodiversity loss, thereby transforming current surpluses into future vulnerabilities. To ensure sustainable growth, Assam must transition from resource-dependent development to resource-efficient planning. This involves:

- Enhancing agricultural productivity through sustainable intensification and the development of climate-resilient crops;
- Expanding irrigation and water harvesting systems to address water scarcity.
- Strengthening urban land-use regulation and green infrastructure planning to prevent unsustainable urban sprawl.
- Diversifying the energy portfolio towards renewable sources such as solar, micro-hydro, and biomass to reduce reliance on fossil fuels.
- Promoting population stabilization programs, education, and livelihood diversification to balance demographic growth with resource limitations.

Furthermore, the incorporation of carrying capacity-based indicators into district planning frameworks could serve as early warning mechanisms for environmental stress. Scenario modeling indicates that an improvement in resource-use efficiency by 10–15% could enable Assam to stabilize its population–resource balance by 2040 without surpassing critical ecological thresholds. Conversely, a lack of action may lead to a progressive decline in per capita resource security, resulting in intensified land degradation, food insecurity, and water stress. In summary, Assam's long-term sustainability is contingent upon adaptive governance, equitable resource distribution, and technological innovation. By aligning demographic planning with carrying capacity assessments, the state can guide its development trajectory toward a resilient and regenerative future, ensuring that population growth remains compatible with environmental and economic sustainability.

Conclusion

The district-wise analysis of Assam's carrying capacity reveals a significant imbalance between population growth and resource availability. Districts such as Nagaon, Barpeta, Dhubri, Karimganj, and Morigaon exhibit critical stress, with population levels surpassing the sustainable limits for land and water resources. These areas are at increasing risk of declining agricultural productivity, groundwater depletion, and ecological degradation, indicating that current demographic patterns are environmentally unsustainable. Conversely, districts like Karbi Anglong, Dima Hasao, Dhemaji, and Chirang exhibit conditions below capacity, reflecting a relative abundance of resources. However, their fragile ecosystems necessitate cautious, eco-sensitive development to prevent forest loss and soil erosion. The study underscores a distinct regional disparity: the densely populated Brahmaputra and Barak plains face acute resource pressure, whereas the hilly and forested districts retain untapped ecological potential. Addressing this divide requires region-specific strategies that align demographic trends with environmental capacity. Achieving sustainable equilibrium in Assam necessitates efficient water and land management, population stabilization, and the adoption of renewable energy. Integrating carrying capacity indicators into regional planning will enable policymakers to anticipate stress thresholds and design adaptive interventions. Overall, the findings affirm that Assam's sustainability depends on aligning population growth with the regenerative limits of its ecosystems. By embedding carrying capacity principles into planning and governance, the state can balance development with conservation, ensuring ecological stability, food security, and long-term socio-economic resilience.

References

Aktymbayeva, A., Kaliyeva, A., Artemyev, A., Sapiyeva, A., Assipova, Z., & Nuruly, Y. (2023). Balancing Nature and Visitors for Sustainable Development: Assessing the Tourism Carrying Capacities of Katon-Karagay National Park, Kazakhstan. Sustainability, 15(22), 15989. https://doi.org/10.3390/su152215989

Alexandratos, N., & Bruinsma, J. (2012). World agriculture towards 2030/2050: The 2012 revision. FAO.

Bruinsma, J. (Ed.). (2003). World agriculture: Towards 2015/2030.

FAO.

Daily, G. C., & Ehrlich, P. R. (1992). Population, sustainability, and Earth's carrying capacity. BioScience, 42(10), 761–771.

Falkenmark, M. (1989). The massive water scarcity now threatening Africa: Why isn't it being addressed? Ambio, 18(2), 112–118.

Falkenmark, M., & Widstrand, C. (1992). Population and water resources: A delicate balance. Population Bulletin, 47(3), 1–36.

Food and Agriculture Organization. (2003). World agriculture: Towards 2015/2030. FAO.

Odum, E. P., & Barrett, G. W. (2005). Fundamentals of ecology (5th ed.). Brooks/Cole.

Rees, W. E. (1992). Ecological footprints and appropriated carrying capacity. Environment and Urbanization, 4(2), 121–130.

United Nations Environment Programme. (2012). Global environment outlook (GEO-5). UNEP.

Anthony, B. (2023). The Role of Community Engagement in Urban Innovation Towards the Co-Creation of Smart Sustainable Cities. Journal of the Knowledge Economy, 15(1), 1592–1624. https://doi.org/10.1007/s13132-023-01176-1

Bhattacharyya, R., Das, B. S., Poesen, J., Mandal, U. K., Santra, P., Datta, A., Bhatia, A., Lalitha, M., Sarkar, D., Kumar, G., Madhu, M., Chaudhari, S. K., Mandal, D., Sharma, P. C., Mandal, A. K., Ghosh, A., Ghosh, B. N., Kumar, M., Singh, R. J., … Reddy, N. N. (2023). Soil degradation and mitigation in agricultural lands in the Indian Anthropocene. European Journal of Soil Science, 74(4). https://doi.org/10.1111/ejss.13388

Bhattacharyya, R., Sarkar, D., Mishra, P., Das, K., Rao, C., Ghosh, B., Franzluebbers, A., Hati, K., Lalitha, M., Anil, K., & Mandal, B. (2015). Soil Degradation in India: Challenges and Potential Solutions. Sustainability, 7(4), 3528–3570. https://doi.org/10.3390/su7043528

Chettry, V., & Surawar, M. (2020). Urban sprawl assessment in Raipur and Bhubaneswar urban agglomerations from 1991 to 2018 using geoinformatics. Arabian Journal of Geosciences, 13(14). https://doi.org/10.1007/s12517-020-05693-0

Das, B. R., Bhuyan, M. J., & Deka, N.

(2024). Exploring cultural ecologies of the Karbi Tribe in Assam, India, through traditional ecological knowledge and skills (TEKS). Asian Ethnicity, 26(3), 486–509. https://doi.org/10.1080/14631369.2024.2433599

Dhakal, N., Salinas-Rodriguez, S. G., Hamdani, J., Abushaban, A., Sawalha, H., Schippers, J. C., & Kennedy, M. D. (2022). Is Desalination a Solution to Freshwater Scarcity in Developing Countries? Membranes, 12(4), 381. https://doi.org/10.3390/membranes12040381

Eisenmenger, N., Noll, D., Pichler, M., Schalmann, E., Gingrich, S., Krenmayr, N., Wandl, M.-T., & Plank, B. (2020). The Sustainable Development Goals prioritize economic growth over sustainable resource use: a critical reflection on the SDGs from a socio-ecological perspective. Sustainability Science, 15(4), 1101–1110. https://doi.org/10.1007/s11625-020-00813-x

Eshbayev, O., Xursandov, K., Pulatovna, K. U., Jamalova, G., & Sitora, A. (2024). Advancing Green Technology Systems through Digital Economy Innovations: A Study on Sustainable. E3S Web of Conferences, 576, 02009. https://doi.org/10.1051/e3sconf/202457602009

Gulishengmu, A., Tian, L., Xu, X., Li, Y., Huang, Z., Gao, Y., Yang, G., & Pan, Y. (2023). Analysis of Water Resource Carrying Capacity and Obstacle Factors Based on GRA-TOPSIS Evaluation Method in Manas River Basin. Water, 15(2), 236. https://doi.org/10.3390/w15020236

Hatab, A. A., Ravula, P., Lagerkvist, C.-J., & Nedumaran, S. (2021). Perceptions of the impacts of urban sprawl among urban and peri-urban dwellers of Hyderabad, India: a Latent class clustering analysis. Environment, Development and Sustainability, 24(11), 12787–12812. https://doi.org/10.1007/s10668-021-01964-2

Hsu, W.-L., Xu, H., Zhang, C., Shiau, Y.-C., Shen, X., & Liu, H.-L. (2021). Integrated Evaluations of Resource and Environment Carrying Capacity of the Huaihe River Ecological and Economic Belt in China. Land, 10(11), 1168. https://doi.org/10.3390/land10111168

Joshi, H., Subbarao, S. K., Sharma, S. K., Shalini, S., Mallick, P. K., Biswas, S., Valecha, N., Dash, A. P., Dev, V., Verma, A., Malhotra,

M., Nanda, N., Prajapati, S. K., & Kaul, A. (2007). Genetic structure of Plasmodium falciparum field isolates in eastern and north-eastern India. Malaria Journal, 6(1). https://doi.org/10.1186/1475-2875-6-60

Kumari, D., Shashwat, S., Verma, P. K., & Giri, A. K. (2024). Examining the nexus between carbon dioxide emissions, economic growth, fossil fuel energy use, urbanization and renewable energy towards achieving environmental sustainability in India. International Journal of Energy Sector Management, 19(3), 731–746. https://doi.org/10.1108/ijesm-05-2024-0007

Kuuluvainen, T., Angelstam, P., Kubota, Y., Frelich, L., Jõgiste, K., Lafleur, B., Koivula, M., & Macdonald, E. (2021). Natural Disturbance-Based Forest Management: Moving Beyond Retention and Continuous-Cover Forestry. Frontiers in Forests and Global Change, 4. https://doi.org/10.3389/ffgc.2021.629020

Lal, R. (2012). Climate Change and Soil Degradation Mitigation by Sustainable Management of Soils and Other Natural Resources. Agricultural Research, 1(3), 199–212. https://doi.org/10.1007/s40003-012-0031-9

Lam, D. (2011). How the World Survived the Population Bomb: Lessons From 50 Years of Extraordinary Demographic History. Demography, 48(4), 1231–1262. https://doi.org/10.1007/s13524-011-0070-z

Mirza, M. M. Q. (2010). Climate change, flooding in South Asia and implications. Regional Environmental Change, 11(S1), 95–107. https://doi.org/10.1007/s10113-010-0184-7

Octavia, D., Prameswari, D., Adalina, Y., Mindawati, N., Njurumana, G. N., Suharti, S., Ekawati, S., Dharmawan, I. W. S., Yeny, I., Hani, A., Supriyanto, B., Rohadi, D., Hadi, E. E. W., Suratman, S., Murniati, M., & Nugroho, H. Y. S. H. (2022). Mainstreaming Smart Agroforestry for Social Forestry Implementation to Support Sustainable Development Goals in Indonesia: A Review. Sustainability, 14(15), 9313. https://doi.org/10.3390/su14159313

Sharma, P., Sharma, P., & Thakur, N. (2024). Sustainable farming practices and soil health: a pathway to achieving SDGs and future prospects. Discover Sustainability, 5(1). https://doi.org/10.1007/s43621-024-00447-4

Shehadeh, A., Arar, M., & Alshboul,

O. (2024). Enhancing Urban Sustainability and Resilience: Employing Digital Twin Technologies for Integrated WEFE Nexus Management to Achieve SDGs. Sustainability, 16(17), 7398. https://doi.org/10.3390/su16177398

Subbarayan, S., Saqr, A. M., Ramsankaran, R., Youssef, Y. M., Dąbrowska, D., Alarifi, N., Singh, L., & Visweshwaran, R. (2025). Soil and Water Assessment Tool-Based Prediction of Runoff Under Scenarios of Land Use/Land Cover and Climate Change Across Indian Agro-Climatic Zones: Implications for Sustainable Development Goals. Water, 17(3), 458. https://doi.org/10.3390/w17030458

Vaidya, H., & Chatterji, T. (2019). SDG 11 Sustainable Cities and Communities (pp. 173–185). Springer Singapore. https://doi.org/10.1007/978-981-32-9927-6_12

Wang, J., Wang, H., Yin, Y., Zhao, Y., & Shang, Y. (2015). Beijing's Water Resources: Challenges and Solutions. JAWRA Journal of the American Water Resources Association, 51(3), 614–623. https://doi.org/10.1111/1752-1688.12315

Wang, L., & Liu, H. (2019). Quantitative evaluation of Tibet's resource and environmental carrying capacity. Journal of Mountain Science, 16(7), 1702–1714. https://doi.org/10.1007/s11629-018-5148-2

Wang, Y., Peng, B., Wei, G., & Elahi, E. (2019). Comprehensive Evaluation and Spatial Difference Analysis of Regional Ecological Carrying Capacity: A Case Study of the Yangtze River Urban Agglomeration. International Journal of Environmental Research and Public Health, 16(18), 3499. https://doi.org/10.3390/ijerph16183499

Weitzman, J., & Filgueira, R. (2019). The evolution and application of carrying capacity in aquaculture: towards a research agenda. Reviews in Aquaculture, 12(3), 1297–1322. https://doi.org/10.1111/raq.12383

Zhu, Y., Xia, J., Drake, S., & Lü, H. (2009). Analysis of Temporal and Spatial Differences in Eco-environmental Carrying Capacity Related to Water in the Haihe River Basins, China. Water Resources Management, 24(6), 1089–1105. https://doi.org/10.1007/s11269-009-9487-1

DELVE X (I) 2026

(A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University)
ISSN : 2278-7402

Integrating the Indian Traditional Pedagogical Strategies Storytelling into Modern Curriculum at Primary: an IKS based Study Aligned with NEP 2020

Sikha Bhagawati[1*]

Accepted : 20 July, 2026

Abstract

The Indian education system has continuously progressed through the construction, reconstruction and reformulation of educational policies to address the changing challenges, needs and aspirations of society. The history says that our education system was rich with high valued culture, ethics and inclusiveness. The New Education Policy 2020 has emphasised on integration and inculcation of traditional Indian knowledge in a more refined way. Storytelling is an indigenous pedagogical practice that played a significant role in the upbringing and education of younger generations in Indian society. This paper identifies the existing gaps between traditional pedagogical practices

*Correspondence :
Email: sikhab84@gmail.com

[1]Department of Education
Nowgong Girls' College, Nagaon, Assam-782001

Published offline : 7 August

and modern educational approaches while examining the possibilities of integrating storytelling into the present curriculum framework at the primary level. However, this method has a high potentiality in transferring knowledge, so this can be used in a more scientific and methodical way. This study uses a qualitative approach to analyse how the storytelling pedagogy can make the study more joyful and interesting for the young minds of the students. This study relates and tries to find out the gaps and scope between the traditional knowledge system and strategies of NEP 2020.

Keywords NEP 2020; Indian knowledge system; Storytelling; Pedagogy; Potentiality

Introduction

Indian Education is rich by its culture, ethos and indigenous characteristics in it. Our education system is enriched by its holistic nature, adaptability, originality, innovativeness, inclusiveness, which are essential ingredients to enlighten the native citizens. Therefore, we had found many great personalities like Barahmihir, Arjyabhatta, Ramanujan etc. who had contributed and played a significant role in the history of education. In this aspect our curriculum and the indigenous pedagogy had received a significant place. The pedagogy and the strategies are very scientific and philosophic in nature. Therefore, our education system had given birth of great philosopher, educationist, scientist, poet, noble laureate etc. An education system mainly depends on the its nature. Nature includes how it treats its three poles that is teacher, student and the environment. In the third pole curriculum and the teaching strategy can be included with environment. The present literacy rate is 80.9% where gender gaps and differences in states literacy rate are still prevailed. Therefore, it is very difficult to prepare a balanced educational plan to suits every corner of the people of the country. But since Independence, our government has tried continuously and achieved a significant height. But still there is lot to achieve. Our biggest strength is our population with young age group. So, the most important point is to educate the youngsters with appropriate skills. Therefore NEP 2020 has given stress on Skill education. Teaching methods plays a pivotal role in educating the young minds. In this advanced stage of science and technology, some of the developed countries step back to their traditional mode of teaching practice, mixing with smart use of scientific pedagogy. Our Indian history, especially in North East India, Story-telling had extensively used

in practice. Usually, the elder members of the society had used some describing imaginary stories to their younger ones to teach them values, cultures, and many a times to develop life skills. But with the flow of time, changes have come in our societal norms and livelihood. The abrupt uses of technology have changed our traditional story telling method.

Only man has the capacity of imagination. Kids have their own world of imagination. Only for the power of imagination a child imagine himself as a spiderman, batman and so on. Different scientific evolution, discoveries, arts and culture are the gifts of human imaginary power. We the human civilization has reached at this stage only through the extensive use of human brain with this imaginary capacity. So, our education system has the scope to develop or child to think critically, image like Newton and Pablo Piccaso. So, students should teach to think freely, act freely and to fly as much as they can. Then only they would know their own limitation, capacities and boundaries.

Objectives

1. To study how the Parampara (traditional) teaching methods, i.e., storytelling can be used in a more scientific and techno-based way.
2. To study the relevance of storytelling method and its influence on the development of the power of critical thinking, imagination, problem solving at primary level.
4. To identify the needs and gap between the modern pedagogy and traditional mode of teaching such as storytelling within the framework of NEP 2020.
5. To study the perception of teachers' and guardians in adoption of story stelling as method of pedagogical implementation in a more refined form under the dominion of NEP 2020.

Review of Related Literature

Salehi Mahdie Zahir, Meymand Zahra Zeinaddiny, Saadatmand Zohreh had written a paper entitled, "Storytelling as a Teaching Method: Developing a Curriculum for Effective Implementation". In this paper the researchers' main focuses point is to establish story telling as an instrumental method and it is very effective to develop eight core factors in personality. They are emotional stability, increase in perceptual ability, enhancement in critical thinking, moral development, clearness in vocabulary, academic excellence, literary excellence etc. For this study the researchers use the grounded theory and purposive sampling method.

Mandal, Biswanath, "The Impact of Storytelling as a Pedagogical Tool in Primary Education" This research paper studies that the traditional story telling method is the most effective method for primary school children. This paper

Ahmed, Sabuj, "The Power of Storytelling in Lesson". The researcher explores the merits of storytelling as a method in curriculum. In this paper, the researcher explains how story telling helps to develop the power of imagination, cognitive and emotional transformation in a effective way.

Landrum, R. Eric, Brakke, Karen, McCarthy, Maureen A., "The Pedagogical Power of Storytelling" This paper delves that story telling as a foundation. It enriches and carries our cultural legacy from generation to another with less effort. This paper explores the of various teaching benefits of using story telling as a method. Story telling helps both teachers and students in various aspects like creating interest, reasoning, developing critical thinking etc.

Methodology

Research methodology, is a systematic way to solve a problem. It is a science of studying of studying how research is to be carried out. Essentially, procedures by which researchers go about their work of describing, explaining, and predicting phenomena are called research methodology. Research methodology is way to find out the result of a specific matter or problem that is also referred to research problem. For the present study, required information has mainly collected from secondary sources. It is based upon the intensive study of relevant books, journals, and other published works. Moreover, the researcher has used the following philosophical methods of Mr. Marvin Farber, the American Philosopher to carry out this study.

i. Direct observation
ii. Induction
iii. Deduction
iv. Speculation
v. Intuition
vi. Revelation
vii. Comparative analysis
viii. Authoritarian Method

In this study almost all the methods mentioned above are being used by the investigator.

Results and Discussion

The procedure of building conception is a very complex process. When a child grows and develops gradually he or she follows a special route to form any kind of concept. First, he feels sensation of any object then forms

perception and finally he will develop a concept for his surroundings. Jean Piaget had defined the different stages of cognitive development of a child very beautifully. On the basis of this theory, the educational age of a child has formulated and it is 6 in most of the countries. Now a days the pre schooling age of a child is 3 to 4. Because it is proved that the foundation of a child starts at this period. The educational methods, curriculum even the aims are also scheduled according to their level of intelligence and its growth. According to the age level the children's imagination power has developed and grow stronger. A child's imagination power has developed from the age of 2. At this stage a child pretends and think that everything has a live. They cannot discriminate between the living and non-living things. This characteristic is termed as animism and preoperational stage by Jean Piaget. At the preschool level i.e., from the age level Four to seven imagination is still present but becomes a little bit reality based and more logical. Therefore NEP 2020 has taken concern of this period and improvised the age of the educational structure of the children, which is 5+3+3+4. The first five years is foundational and basic for the children. Therefore, up to class three, there is no examination system and pass fail. They will learn by their own, using the sense organs and with the help of nature. In this period a child can construct and deconstruct all the surrounding things with the imagination power. NEP 2020 has developed a well organised educational planning but the pedagogical aspect should have a mere concern. Because, history said that we have everything that is, a rich culture, an empowered educational system and environment. But somehow, we have lost our root and now we tried to bridge the gap by fuelling and fertilizing with some indigenous knowledge system. One of the main core processes to educate our children is the story telling method through which a child is naturally inclined to learn by their own. Storytelling is a very powerful indigenous tool to develop creativity among the young minds of our children. Storytelling is a very informal method of leaning used in most of the society. It is the process of transmission of knowledge from one generation to another. In Assamese society 'Dakor Bason', 'Burhi Air Sadhu', Shakuntala and some real stories like Bir Chilarai, Lachit Barphukaon, Mahapurusha Sri Manta Sankardeva etc. can have great influence and create imagination and nationality in the budding minds of the students. In India story telling method as an informal pedagogy had started from Gurukula education system. At

this stage, Guru had taught their sishya verbally. They had learned by following the strategy shrabana, manana, and dhanyana (nidhidhyacharana). They just follow the instructions of Guru and Guru patni. Thus, they had learned the rules of life that is Brahacharya, Grahoyastha, Banaprastha and Sansyas. After that when Buddhism had started then the education system was revolutionised through art and craft, drawing, painting, weaving etc. In Indian history, the method of imparting education was mainly dominated by oral and dictation. They directly deliver their knowledge to the disciples. Learning only through listening, chanting, imagining and imitating makes the education more practical and active. Learning through writing was started from Muslim education. Though writing was added in traditional learning system but oral and verbal education system dominate and the power of imagination received the priority. But after the British invasion, the whole education system was uprooted from its origin. The education system was mainly built to create the third grade and fourth grade employee who are meant to follow the orders only, who have no administrative and deceive power. They had tried to create people only through not with brain. They were succeeded in this discourse, and till to date we are far lagging behind whereas Japan has developed in every aspect after the devastation in 1945. They were waking up, holding their status like other developed countries.

India has completed 79 years of independence; our education system has needed more attention yet. In 2020, NEP has carried hope, aspiration, and a more innovative way of feasible plan of action. Nep 2020 has initiated a three year of pre-primary education level, with the prevalent four years of primary education and now the education pattern has shifted from 10+2+3 to 5+3+3+4. These five (5) years is reconstructed with a child of 3 years that is known as Bal Bhatika, Anganwadi or Preschool and class 1 and 2 that is 3+2=5. NEP 2020 has scientifically constructed and included these years with definite principles. Those are no examination system, bagless education, learning by playing, imagination, activity etc. This policy has tried to introduce the Indian Knowledge System by regenerating the education system with values, life skills, soft skills, traditional and local and folk knowledge which is meant and purposeful only for the locals and environmental needs.

In this regard, inclusion of storytelling as a method of pedagogy would become more powerful and time relevant. As NEP 2020 has particularly

given importance on indigenous education system, so time has arrived to rethink and reevaluate the teaching pedagogy and leaning environment. Our societal pattern is by default more family oriented. So, we are more rely on our family. Though the structure of the family has changed a little bit from joint family to single family but we cannot ignore our heredity and legacy. We can shift and modified our education to the indigenous method of teaching and learning with a more polished, upgraded and scientific way.

Now a days digitization receives a significant place in academics specially in improvising the pedagogical aspects. Kids are getting more interest in visual aids. Therefore, the cartoons, games etc. get popularity. If these process of cartography can be used in a more practical way, then that may be more helpful and useful. Primary school can frame their curriculum in such a way that the traditional story telling becomes more adaptive in new situations and dimensions. As societal norms have changed in every aspect, to cope with the situation and the demand the deliberation and the mode of teaching have also be tuned accordingly.

Drawing on Vygotsky's Social Constructivist Theory and Bruner's Narrative Theory, it examines how stories create meaningful learning experiences. Empirical studies show that storytelling improves vocabulary, retention, and empathy while fostering cultural awareness and critical thinking.

Lev Vygotsky was a contemporary psychologist of Jean Piaget. He was also agreed to the learning theory proposed by Jean Piaget, Bandura's social learning theory and Watson and Skinner's Behaviour theory. They all were agreed in one general point that learning can be more easily possible and acceptable in social environment and in peer groups. They can learn more when they are active naturally. This theory of learning can be termed as learning by doing. When a child's hand and mind are engaged then they learn actively and immediately. Vygotsky, however gave importance on learning in social settings, interaction with family members, elders etc. In this process, consciously and unconsciously they leaned the different life skills and knowledge for worthy living. In this context, it is proved that, storytelling method has a strong connection in imparting education. Because in story telling the child can learn many things only through imagining. They weave their dreams, inculcate ethical and moral values, ensure and gather knowledge

about local environmental issues etc.

In this connection, NEP 2020 has laid the foundation of forming conception at pre-primary level. It is instructed to deliver any instruction with the help of different modules, audio visual aids, art and craft work. The school has developed to adapt the said ambience by drawing and crafting the wall, the curriculum has up dated through picturization. So that the imagination and creativity of the child have built up in a natural way. The guardians, parents have become more concern about their children's education. Government has laid different measures and taken various steps to engage the local community so that primary education can laid a firm infrastructure to build the nation.

Conclusion

Story telling is one of the oldest and best practices prevalent in our societies. It connects our people from older generation with the young ones. It is safest and easiest way of communication and transmission of knowledge. Although it continues in our society but due to transition of the societal norms it has changed. NEP 2020 has tried to inculcate the root of the society and in a more improvised and digital way. These traditional methods of teaching practices are used in present curriculum in a more scientific way. Teachers are trained through proper channel, and community members are also involved in every respect. In primary education, it serves as a dynamic pedagogical tool to enhance listening, comprehension, moral understanding, and creativity. This paper explores the educational impact of storytelling in developing linguistic, cognitive, and socio-emotional skills among young learners. The paper concludes by recommending strategies for integrating storytelling into classroom teaching to promote holistic child development.

Suggestions

Storytelling is a powerful tool in the knowledge transmission process from one generation to the next. This method was used extensively in informal way at the communal level. As the time has passed, new teaching learning pedagogy has arrived and the old method has subsequently faded away. But after the introduction of NEP 2020 with the increasing importance of Indian Knowledge, the time has come to revive, reconstitute the gap between the traditional and modern method of pedagogy in a more vibrant and innovative way. There are many scope for further study in this direction to bridge the gap.

- Introduction of Storytelling at primary level through blended mode of pedagogy

  Story telling should be systematically introduced through blended mode of teaching that is digitally displayed the stories. Th e kids are naturally inclined to the audio-visual display of their stories. Before the advancement of science and technology, the knowledge transmission process was different. It was oral in most of the time. But the development of ICT has changed the scenario. So, to keep the pace of time the method of teaching should be blended that traditional as well scientific.

- Teacher Training on Child psychology and Pedagogy

  The most emergence field is child psychology and their nurturing in a healthier way. Teachers should be provided with proper training regarding the psychology of the young minds according to the changed circumstances. Because societal norms, parental behaviour has changed.

- Integration of Skill Education and Activity Based Learning based on community perspective

  The young minds are very active in nature. They never like to sit ideologically. Moreover, learning becomes more effective when body and mind correlates and actively involved in the process of learning. They have learned what they have taught and seen from their birth. So, community-based life skill and soft skill training would be more helpful to nurture and develop critically, innovativeness, emotionally stable.

- Integration of Folklore, Regional Stories and Redesign of Curriculum Paradigm

  NEP 2020 has taken revolutionary steps in the field of education sector. But needs more attention and specification in shaping the personalities of the young ones. Curriculum is the pedagogical tool in the hands of the teacher through which they can draw rainbows in the young minds of the students. In such cases school should involve parents, grandparents, and local community members in storytelling activities in schools periodically. Their participation can bridge the gap between formal education and traditional knowledge systems while strengthening intergenerational learning

- Research on Development of Pedagogy to Nurture the Innovativeness, Creativity and Potentialities among the Young Child

  More empirical research should be conducted to examine the long-term educational impact of storytelling pedagogy on children's cognitive, emotional, and social development. Indigenous stories and oral traditions should also be documented and preserved for educational purposes.

References

Dey, T. (2015). Folk tales of North East India: A relook for environmental studies classroom transaction. Pedagogy of Learning, 3(2), 14–27.

Landrum, R. E., Brakke, K., & McCarthy, M. A. (n.d.). The pedagogical power of storytelling.

Mandal, B. (n.d.). The impact of storytelling as a pedagogical tool in primary education.

Ministry of Education, Government of India. (2020). National Education Policy 2020. Government of India.

Salehi, M. Z., Meymand, Z. Z., & Saadatmand, Z. (n.d.). Storytelling as a teaching method: Developing a curriculum for effective implementation.

Van der Veer, R. (2020). Vygotsky's theory. In The Encyclopaedia of child and adolescent development (pp. 1–7). John Wiley & Sons. https://doi.org/10.1002/9781119171492.wecad101

Submission Guidelines for

DELVE — A Multidisciplinary Peer-Reviewed Research Journal of Nagaon University

Manuscript Submission

- Manuscripts must be submitted via email to delvehssnagaonuniversitv.ac.in.
- Papers can be up to around 8,000 words (research articles), including figures and tables.
- Submissions must be original, unpublished, and not under consideration elsewhere.
- All authors must have approved the manuscript prior to submission.

Types of Contributions

- Original Research Articles
- Review Articles
- Short Communications
- Case Studies

Manuscript Preparation

- Prepare manuscripts in **Microsoft Word** (.docx) format.
- A typical manuscript should include: **Title Page** (title, author(s), affiliations, corresponding author details); **Abstract** (150-250 words); **Keywords** (4-6); **Main Text; References; Acknowledgements** (if applicable); **Declarations** (conflicts of interest, funding, data availability).
- Authors must include affiliations, and postal and e-mail addresses.

Formatting Guidelines

- Use British spellings throughout (e.g., “organise”, “labour”, “programme”, “centre”).
- Spell out numbers from one to nine; use figures for 10 and above. Use only figures for exact measurements.
- Use single quotes throughout; double quotes only within single quotes.
- Quotations of 45 words or more should be indented from the text.
- Tables and figures must be numbered sequentially, submitted in high resolution (minimum **300 dpi**), and cited in the text.
- References should follow **APA 7th edition** citation style.

In-text Citations (APA 7th edition)

- Single author: (Author, Year, p. 00); Two authors: (Author & Author, Year); Three or more: (Author et al., Year)

References

Book: Author, A. A. (Year). Title of the work. Publisher.

Book Chapter: Author, A. A. (Year). Title of chapter. In E. E. Editor (Ed.), Title of the book (pp. 00-00). Publisher.

Journal article: Author, A. A., & Author, B. B. (Year). Title of article. Journal Name, 00(0), 00-00. https://doi.org/xxxxx

Ethical Compliance

- Authors must ensure proper authorship attribution and disclosure of competing interests. • Ethical approval must be obtained where required; informed consent is mandatory for human subjects research.

Peer Review

- All manuscripts are subject to double-anonymous peer review.
- Submissions are first screened by the editorial team for scope and quality before being sent for external review.
- The editorial decision may be: Accept, Minor Revisions, Major Revisions, or Reject.

Fees

- **No Submission Fees** — authors are not required to pay any fee at the time of submission.
- **No Article Processing Charges (APCs)** — the journal does not charge any publication or processing fees.
- The journal is fully open access, supported by Nagaon University.

For further details and submission, contact the editorial team at *delvehss@napaonuniversity.ac.in* or visit ***https://nagaonuniversity.ac.in/joumaldetails.php?page=93***

Nagaon University

www.nagaonuniversity.ac.in