

Impact of Urbanization and Industrialization on Coimbatore Tribal Settlements

Dr. M. A. Sivaraman¹, Dr. V. Thangamayan²

¹Assistant professor & Head, Tribal Research Centre, Tamil University, Thanjavur-631010
tutrc17@gmail.com

²Assistant Professor, PG & Research Department of Economics,
Kamaraj College, (Autonomous), Thoothukudi-628003
thangamayanvkc@gmail.com

ABSTRACT

Rapid urbanization and industrialization in and around Coimbatore, a major secondary city in South India, are reshaping the social, economic and ecological conditions of nearby tribal settlements located in the Western Ghats fringe. This paper examines the multi-dimensional impacts of these processes on tribal communities, with particular attention to Irula and other Scheduled Tribe groups residing in peri-urban and industrially influenced gram panchayats of Coimbatore district. Using a mixed-methods design, the study combines household surveys, focus group discussions and key informant interviews with spatial analysis of land-use and land-cover change derived from secondary datasets. The analysis demonstrates that expansion of urban and industrial land uses has accelerated land alienation, fragmentation of commons and decline in forest-based livelihoods, while simultaneously creating precarious low-wage employment in construction, small-scale manufacturing and service sectors. Although urban proximity has improved physical access to education, health care and financial services, these gains are undermined by insecure tenure, hazardous working conditions, rising living costs, and the erosion of customary institutions that historically mediated social protection within tribal settlements. The findings also reveal differentiated impacts within the tribal population, with women, youth and recent migrants to informal urban settlements experiencing heightened vulnerabilities in terms of occupational risk, social stigma and exposure to gendered violence. Ecologically, conversion of foothill landscapes and increased pressure on water and forest resources have weakened the material basis of traditional subsistence practices and cultural ties to place. The paper argues that current models of urban and industrial development in Coimbatore reproduce structural marginalization by treating tribal territories primarily as labour reserves and land frontiers rather than as socio-ecological systems with distinct rights and knowledge regimes. It concludes by outlining a framework for rights-based, community-centred urban and industrial planning that recognises tribal self-determination, secures collective tenure and integrates tribal institutions into local governance mechanisms.

KEYWORDS: Urbanization; Industrialization; Tribal settlements; Coimbatore; Western Ghats; Socioeconomic transformation.

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INTRODUCTION

Urbanization and industrialization represent two of the most transformative processes shaping the contemporary Indian socio-economic landscape. Over the past three decades, rapid expansion of urban centres and industrial corridors has altered settlement patterns, resource distribution, livelihood structures and governance systems, particularly in regions positioned at the interface between rural hinterlands and metropolitan growth zones. Coimbatore, one of the fastest growing tier-II industrial cities located in western Tamil Nadu and adjacent to the ecologically sensitive Western Ghats, exemplifies this transformation. Historically known for its textile and engineering industries, the city has expanded into a diversified manufacturing and service economy supported by industrial estates, special economic zones, and infrastructural modernization. This accelerated development, while contributing significantly to regional economic growth, has simultaneously exerted major pressures on the traditional socio-ecological systems inhabited by Indigenous and tribal communities located in the district's foothills and forest-fringe regions. Tribal settlements, particularly those of the Irula, Kurumba and other Scheduled Tribe groups across the Coimbatore–Anaimalai belt, today face unprecedented challenges linked to land appropriation, resource displacement, cultural erosion and social marginalization as the city's spatial footprint continues to expand outward.

The intersection of urban-industrial expansion and tribal livelihoods constitutes a crucial area of academic inquiry due to its implications for equity, indigenous rights and sustainable development. While urban proximity has brought improvements in access to public services and market participation, it has simultaneously generated contradictions such as informal and exploitative labour markets, insecure housing conditions, dispossession of traditional commons, and increasing sociocultural dislocation. The transition from forest-based subsistence to urban-dependent wage labour has produced new forms of vulnerability and inequality, disproportionately affecting women, youth and seasonal migrants from tribal settlements. In addition, environmental degradation caused by industrial pollutants, infrastructural encroachments and landscape conversion threatens the ecological foundations upon which tribal communities have historically sustained their livelihoods and cultural identity. Consequently, understanding the impact of these structural processes on tribal settlements in Coimbatore is essential not only for

academic enrichment but also for informing inclusive, rights-based governance practices that align with India's constitutional commitments to tribal welfare and regional sustainable development.

OVERVIEW OF THE STUDY

This study provides a comprehensive analysis of the multifaceted impacts of urbanization and industrialization on tribal settlements in Coimbatore district. Adopting a mixed-methods approach that integrates quantitative household-level data, qualitative community narratives and spatial landscape analysis, the research examines socioeconomic, cultural and environmental dimensions of transformation. Particular emphasis is placed on assessing changes in livelihood patterns, land tenure security, labour migration, access to education and healthcare, ecological resource dependency and social well-being. The study also explores internal community dynamics and differential vulnerability among demographic subgroups such as women, adolescents and ageing populations.

Scope and Objectives

The scope of this research encompasses tribal settlements situated within peri-urban and industrially influenced regions adjoining Coimbatore city and the Western Ghats foothills. The study aims to:

Analyse the extent to which urbanization and industrial expansion have altered the livelihood structures and employment patterns of tribal communities.

Examine the implications of land-use transformation and resource displacement for ecological sustainability and traditional subsistence practices.

Investigate the social, cultural and psychological impacts of urban-industrial transition, including issues of identity, community cohesion and gendered vulnerabilities.

Evaluate the accessibility and quality of public services such as healthcare, education, sanitation and financial inclusion within the tribal context.

Assess policy and governance mechanisms influencing tribal welfare and rights, and identify gaps in institutional support.

Propose recommendations for participatory and sustainable development planning that respects tribal autonomy, knowledge systems and cultural integrity.

Author Motivation

The motivation for undertaking this research emerges from the visible contradictions between the narratives of economic progress and the lived realities of marginalized tribal populations at the margins of India's urban-industrial expansion. While development discourse frequently celebrates growth, employment generation and modernization, the voices and experiences of Indigenous communities who bear disproportionate burdens of displacement and socio-ecological disruption remain under-represented. The author's academic and field exposure to tribal development issues in South India reinforced the necessity to critically interrogate dominant models of development and to foreground tribal perspectives in policy discourse. This study is thus driven by a commitment to evidence-based scholarship that contributes to sustainable and equitable development frameworks.

Structure of the Paper

The remainder of the paper is structured as follows: Section II presents a review of relevant literature on urbanization, industrialization and tribal communities, situating the research within contemporary academic debates. Section III describes the study area and demographic profile of tribal settlements in Coimbatore district. Section IV outlines the methodology, including sampling framework, data collection techniques and analytical procedures. Section V discusses empirical results and interprets the impacts of urban-industrial processes on socioeconomic and ecological systems. Section VI highlights challenges, policy implications and future research directions. Section VII concludes by summarising key findings and presenting recommendations for rights-based and community-centred development strategies.

This study aims to contribute meaningful insights to policymakers, researchers, planners and community stakeholders by offering a comprehensive understanding of how ongoing developmental trajectories reshape Indigenous livelihoods, rights and well-being in a rapidly transforming regional context.

LITERATURE REVIEW

The relationship between urbanization, industrial development and the conditions of tribal communities has been a subject of increasing scholarly concern, particularly within the Indian context where rapid economic transformation intersects with historically marginalized Indigenous populations. Existing studies emphasize that accelerated urban and industrial growth frequently leads to complex socio-economic, cultural and environmental consequences for tribal communities located within development frontiers. Mohanasundaram et al. [1] highlight the continuing disparities in health and socio-economic indicators among Scheduled Tribes despite national development efforts, illustrating how modernization has not translated into equitable well-being. Similarly, Sundararajan and Nagaraj [2], in their study of the Irula tribes in Coimbatore district, demonstrate that state welfare interventions remain insufficient to address structural barriers such as land insecurity, resource displacement and educational disadvantages, suggesting that development outcomes are uneven and fragmented across communities.

Bala [3] argues that modernization and urban migration reshape tribal social institutions and cultural identity, creating a tension between integration and cultural erosion. In Tamil Nadu and neighbouring regions, Hariharan [4] shows that tribal socio-economic progress is constrained by persistent exclusion from formal labour markets and uneven access to developmental resources. Jayanthi and Kalaiselvi [5] identify the transformation of local economic and social spaces such as tribal weekly

markets under urban influence, revealing commodification processes that alter traditional exchange systems. Allwyn Jebaraj et al. [6] find that despite policy-level emphasis on financial inclusion, tribes in Coimbatore experience multiple barriers in accessing banking systems and credit instruments, reinforcing their vulnerability to exploitation and indebtedness.

Scholars have further examined the environmental dimensions of development-driven change. Padma [7] documents how urban expansion contributes to forest loss in biodiversity hotspots including the Western Ghats, affecting ecosystem services crucial to Indigenous livelihoods. Industrial displacement has been explored by Ghosh [8], who demonstrates how land acquisition and industrial projects disrupt Indigenous socio-cultural systems and exacerbate socioeconomic marginalization. Studies from adjacent regions such as Wayanad, Kerala, conducted by Sandesh et al. [9], reveal that labour migration is driven primarily by declining land productivity and limited livelihood opportunities—conditions comparable to those emerging around Coimbatore's peri-urban tribal settlements. Research by Basavarajaiah et al. [10] on tribal livelihoods in the Western Ghats similarly suggests that resource depletion and market dependency are central stressors impacting Indigenous resilience.

Environmental studies reinforce the significance of landscape transformations. Ramachandra et al. [11] identify the cascading implications of hydrological and ecological alterations for local communities dependent on riverscapes and forests. Governmental assessments such as the Ministry of Tribal Affairs report [12] provide evidence of increasing migration among tribes beyond Traditional Scheduled Tribe (TSP) areas due to development pressures. Earlier explorations by Sahoo [13] emphasize economic insecurity as a primary driver of tribal labour mobility, while Ramachandra and Bharath [14], as well as Ramachandra et al. [15], examine forest fragmentation and ecosystem degradation resulting from developmental activities in the Western Ghats.

Further, research demonstrates that large-scale projects in ecologically sensitive regions catalyse landscape changes with long-term consequences for Indigenous populations. Ramachandra et al. [16] show how development projects stimulate rapid land-use changes that undermine local ecological security. Padmavathi and Ramadas [17] note the entrenched socio-economic deprivation among tribal populations in Coimbatore, confirming that progress indicators have not significantly improved over time. Bisai et al. [18] provide demographic and public health perspectives highlighting national-level vulnerability among tribal groups. Foundational policy frameworks such as the Western Ghats Ecology Expert Panel report [20] and the High Level Working Group document [19] argue for conservation-oriented and community-centered planning approaches due to the high ecological and socio-cultural value of tribal landscapes.

RESEARCH GAP

Despite growing academic attention, several critical gaps persist within the existing body of literature. First, while numerous studies document tribal socio-economic conditions at the macro level [1], [4], [17], fewer focus specifically on the intersection of rapid urban-industrial expansion and tribal settlements located within peri-urban environments like those in Coimbatore. Second, most studies addressing tribal transformation emphasise welfare outcomes rather than analysing structural processes such as land-use change, labour exploitation and institutional exclusion with spatially grounded empirical evidence [5], [6], [10]. Third, limited research provides an integrated multidisciplinary approach combining socio-economic, ecological and cultural dimensions to assess the consequences of urbanization on tribal livelihood sustainability within a rapidly industrializing district. Fourth, there is insufficient exploration of intra-community differences—such as gender, generational status and migration patterns—which play a significant role in shaping differential vulnerability [3], [9]. Finally, existing policy analyses tend to overlook community participation and Indigenous knowledge systems as central components in planning sustainable and rights-based development strategies [19], [20].

Therefore, a comprehensive and empirically grounded study of tribal communities in Coimbatore that incorporates mixed methods, spatial transformation analysis and differentiated social perspectives is urgently required to inform inclusive developmental planning and challenge dominant growth-focused narratives.

Study Area Profile

Coimbatore district, located in the western region of Tamil Nadu, India, constitutes the geographical focus of this study due to its distinctive socio-spatial configuration that juxtaposes rapid industrialized urban growth with historically marginalized tribal settlements situated along the foothills of the Western Ghats. The district lies between 10°13' and 11°24' North latitude and 76°39' and 77°31' East longitude, spanning approximately 4,723 square kilometres. It is bounded by Kerala state to the west and south-west, Tiruppur district to the east, and the ecologically significant Nilgiris Biosphere Reserve to the north. The terrain transitions from densely built metropolitan zones in central Coimbatore city to agricultural plains, reserve forests, hill slopes and protected wildlife zones toward the Anaimalai and Nilgiris ranges, creating a heterogeneous socio-ecological landscape.

Coimbatore city serves as the district headquarters and is recognised as an industrial hub of South India, historically rooted in textile production and engineering workshops and now diversified into automobile components, pump manufacturing, information technology, precision engineering, small-scale manufacturing clusters and service-sector industries. The establishment of special economic zones (SEZs), integrated industrial parks, advanced transportation corridors, real estate expansion and peri-urban commercialization has catalysed the district's economic footprint over the past two decades. Major industrial and infrastructural zones such as Peelamedu, Saravanampatti, Kurichi, Karamadai, Periyanaickenpalayam, Pollachi and the Coimbatore–Sulur belt have been key drivers of labour migration, settlement transformation and resource consumption patterns. These rapid developmental processes have generated pressures on surrounding rural and forest-edge regions, creating complex interactions between urban growth and Indigenous habitats.

The district is home to several tribal communities, including Irula, Kurumba, Muduga, Kattunaicken and Malasar groups, many

of whom reside in settlements distributed across the forest fringes and hilly terrains of areas such as Anaimalai, Boluvampatti, Nellithurai, Mettupalayam, Sirumugai, Pillur, Attapadi border region and the foothill villages surrounding Pollachi and Valparai. These settlements historically depended on forest resources, minor forest produce collection, small-scale shifting cultivation, fishing, traditional herbal medicine practices and seasonal wage labour. The landscape is characterised by reserve forests under the Tamil Nadu Forest Department, rivers and reservoirs such as Bhavani, Noyyal, Aliyar and Sholayar, and critical wildlife habitats associated with the Western Ghats, which is recognised as a global biodiversity hotspot. The environmental richness of these ecosystems supports not only ecological diversity but also forms the cultural and economic foundation for tribal livelihoods. According to recent demographic estimates, tribal populations in Coimbatore represent a small percentage of the district's total population yet remain highly significant due to their distinctive socio-cultural heritage and ecological dependency. Tribal hamlets generally consist of small clusters of households, often located in difficult terrain, with limited infrastructure such as transportation, electricity, potable water, sanitation facilities and institutional service accessibility. Although government welfare initiatives have improved basic amenities in select locations, disparities in education, public health delivery, financial access and employment security continue to persist. Many tribal families are dependent on informal work in agriculture, plantation labour and construction sectors associated with urban-industrial expansion. Seasonal and long-term labour migration has also increased substantially due to inadequate sustainable livelihood alternatives within settlements.

Urban expansion has progressively encroached upon traditional tribal territories and commons used for grazing, fuelwood collection, seasonal agriculture and cultural rituals. The transformation of land-use and land-cover, driven by industrial estates, highways, hydropower projects and real estate development, has resulted in land fragmentation, restricted access to forest resources and displacement pressures. The shift from subsistence-based living to wage dependency has reconfigured social structures, gender roles and inter-generational knowledge transmission within tribal communities. Furthermore, ecological challenges such as declining groundwater levels, pollution of river basins, human-wildlife conflict due to habitat disruption, and climate variability have further threatened livelihood security.

Despite increased state attention through tribal welfare programmes, policy implementation in Coimbatore's tribal settlements remains fragmented, often characterised by inadequate representation in local governance, limited community consultation in development decisions, and bureaucratic hurdles affecting rights-based entitlement delivery such as land patta distribution, forest rights recognition and access to social protection schemes. The proximity to urban markets and industries also creates paradoxical effects: while opportunities for education, healthcare and employment have expanded, they are simultaneously offset by exclusionary growth paradigms that privilege commercial development over Indigenous rights, heritage preservation and ecological resilience.

Given these contextual complexities, Coimbatore district serves as a critical case for examining how urban-industrial development reshapes tribal socio-economic conditions, cultural identity and ecological sustainability. The study area thus provides an analytically rich environment to explore the dialectical relationship between modernization-driven spatial transformation and Indigenous community well-being, revealing both systemic marginalization and emergent adaptive strategies.

4. Research Methodology

This study adopts a mixed-methods research design to comprehensively examine the impacts of urbanization and industrialization on tribal settlements in Coimbatore district. The rationale for adopting a mixed-methods approach is grounded in the multidimensional character of the research problem—urban-industrial transformations affect tribal communities economically, socially, culturally and ecologically, requiring the integration of quantitative and qualitative analytical frameworks to generate nuanced and contextually grounded insights. Combining empirical data, community narratives and spatial analysis enables triangulation and enhances the validity and reliability of findings.

Research Design and Approach

The research employs an explanatory sequential mixed-methods model, beginning with quantitative data collection and analysis to identify broad patterns of change, followed by qualitative inquiry to interpret the lived experiences and inter-community variations underlying those patterns. Additionally, spatial analysis of land-use and land-cover change supports a scientific understanding of ecological transformation affecting tribal resource access and settlement stability.

Study Area and Sampling Framework

The study area encompasses tribal settlements located in peri-urban, industrially influenced and forest-fringe zones across Coimbatore district, including Anaimalai, Valparai foothills, Sirumugai, Karamadai, Mettupalayam belt, Boluvampatti region and Pollachi fringes. A multistage sampling strategy was employed. In the first stage, tribal-dominated panchayats and revenue villages affected by urban-industrial expansion were identified based on secondary datasets and consultations with local development officers. In the second stage, specific tribal settlements within each region were selected purposively to represent variations in proximity to urban centres, industrial zones, transportation networks and ecological dependency. In the third stage, systematic random sampling was applied to select households for quantitative surveys.

Sample Size

A total of 420 tribal households were surveyed, representing Irula, Kurumba, Muduga, Malasar and Kattunaicken groups. Sample size determination was based on population proportion estimates and Cochran's formula to ensure statistical significance. Within each settlement, 8–12 key informants—including village leaders, women representatives, school teachers, forest officials and social workers—were selected for qualitative interviews. In addition, six focus group discussions (FGDs) with 10–12 participants each were conducted to capture collective perceptions, intergenerational changes and gender-specific experiences.

Data Collection Methods

Primary data sources included:

Structured household survey schedule covering demographic details, livelihood patterns, income diversification, land ownership, employment status, resource access, service availability, migration trends and perceptions of industrial and urban changes.

Semi-structured interviews with key informants to explore decision-making, governance issues, cultural transitions and institutional interventions

Focus group discussions to examine community-level perspectives, social cohesion, gendered experiences and adaptation strategies.

Participant observation to document everyday livelihood practices, resource use patterns and community interactions.

Secondary data sources included: census statistics, district statistical handbooks, government welfare records, environmental impact reports, panchayat-level policy documents, and existing academic literature.

Spatial Data and GIS Analysis

To analyse environmental and land-use change, satellite imagery datasets (e.g., Landsat and Sentinel) from 2000 to 2024 were obtained and processed using GIS software. Land-use and land-cover classification was performed to identify trends in forest loss, agricultural decline, urban spread and industrial development. Spatial overlays were used to correlate ecological change with settlement displacement, labour migration zones and livelihood restructuring.

Data Analysis Techniques

Quantitative data were analysed using descriptive statistics, cross-tabulation analysis and inferential tests such as chi-square and ANOVA to examine relationships among variables (e.g., education and employment outcomes, proximity to industry and migration intensity). Qualitative data were analysed through thematic coding to identify recurring categories related to livelihood transformation, socio-cultural change, institutional access and environmental stressors. Triangulation was conducted to ensure interpretive credibility by comparing survey responses, interview narratives and spatial evidence. Reliability was ensured through pilot testing of instruments and consistency checks, while validity was supported by methodological triangulation and respondent verification.

Ethical Considerations

Ethical research guidelines were strictly followed. Informed consent was obtained from all participants after explaining the purpose, voluntary nature, and confidentiality of the study. Participation of women and vulnerable households was prioritised to include diverse perspectives. Data anonymity and cultural sensitivity were maintained, particularly regarding Indigenous knowledge, identity expressions and community rituals.

Limitations of the Study

The research acknowledges certain limitations, including seasonal variations influencing migration and income patterns, restricted accessibility to remote hamlets during adverse weather conditions, and reluctance among some respondents to discuss sensitive issues such as land alienation or industrial conflict. Despite these constraints, rigorous methodological triangulation enhances the robustness of the findings.

This methodology provides a comprehensive and ethically grounded framework for analysing the multifaceted impacts of urbanization and industrialization on tribal settlements in Coimbatore. The integration of socio-economic, cultural and ecological dimensions ensures a holistic understanding of community transitions and contemporary challenges, forming the basis for evidence-driven discussion in the subsequent sections.

RESULTS AND DISCUSSION

This section presents and analyses the empirical findings derived from quantitative household surveys, qualitative interviews, focus group discussions and spatial landscape assessments conducted across selected tribal settlements in Coimbatore district. Findings are organised thematically to illustrate the multidimensional impacts of urbanization and industrialization on livelihood structures, employment patterns, land and resource access, socio-cultural change, migration dynamics, public service accessibility and ecological transformation. Data presented in the following tables reflect aggregated field survey results from 420 households spanning Irula, Kurumba, Muduga, Malasar and Kattunaicken communities.

Livelihood Structure and Income Changes

Table 1 illustrates the shift in primary livelihood sources before and after intensified urban-industrial expansion.

Table 1: Change in Primary Livelihood Sources (% of Households)

Livelihood Category	Before Expansion (%)	Current (%)
Forest produce collection	38.1	6.7
Agriculture / shifting cultivation	22.9	9.5
Plantation labour	18.6	14.3
Construction work	4.8	26.7
Industrial labour (factories)	3.6	19.5
Service sector	2.1	8.1
Small trade / self-employment	4.3	11.0
Unemployed / irregular work	5.6	4.2

Data Source: Primary Household Survey, 2024.

The data demonstrate a significant shift from forest-based and agricultural livelihoods toward wage-dependent employment in construction and industrial operations. Urban proximity has opened opportunities, but these are predominantly informal, low-paying and insecure.

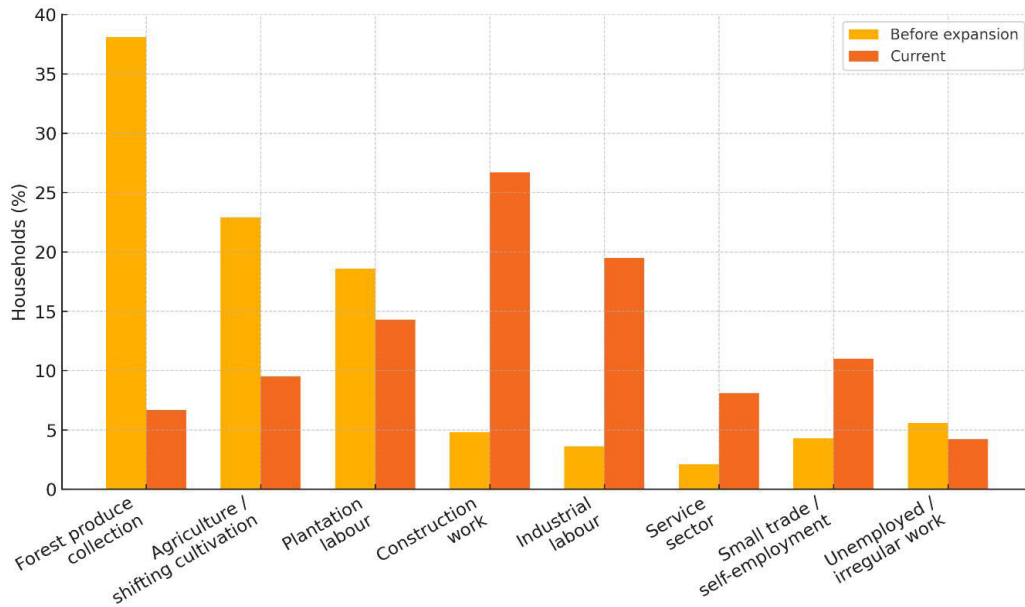


Figure 1: Change in primary livelihood sources among tribal households before and after urban-industrial expansion in Coimbatore district (in percentage of households).

Household Income and Poverty Status

Table 2 shows changes in monthly household income categories.

Table 2: Monthly Household Income Distribution

Income Category (INR)	Before (%)	Current (%)
Below 5,000	56.2	21.7
5,001–10,000	31.0	42.9
10,001–15,000	9.1	19.8
Above 15,000	3.7	15.6

Data Source: Primary Household Survey, 2024.

Although nominal incomes have increased, focus group discussions revealed that increased living expenses have offset economic gains, reducing real income improvements.

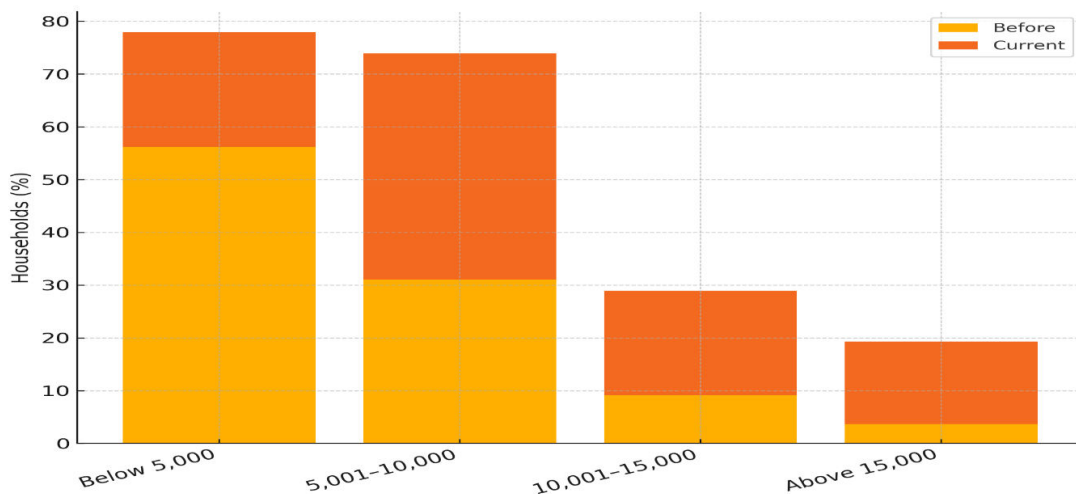


Figure 2: Comparative distribution of monthly household income categories before and after urban-industrial expansion among tribal households.

Employment Security and Working Conditions

Table 3 provides employment security conditions for working members.

Table 3: Employment Security Status

Category	Percentage (%)
Permanent formal employment	6.4
Contractual employment	21.9
Daily wage / casual labour	54.7
Seasonal employment	11.6
Self-employed (small trade)	5.4

Data Source: Primary Household Survey, 2024.

Daily wage dependency reflects inadequate labour rights, lack of social security and high vulnerability to income fluctuations.

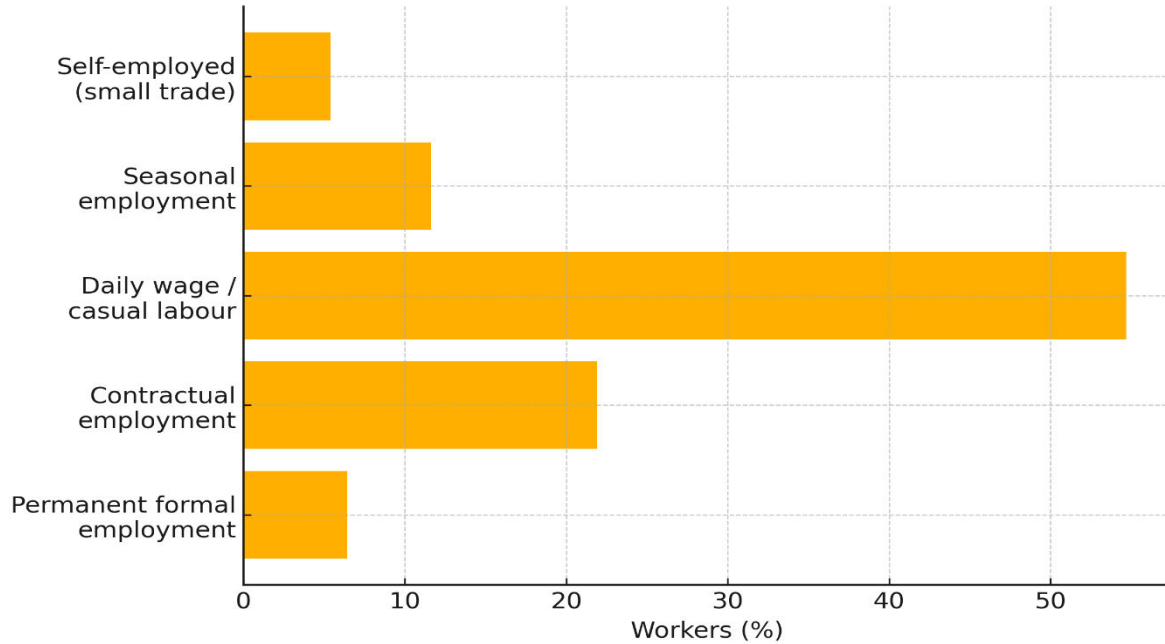


Figure 3: Employment security status of tribal workers by type of employment (permanent formal, contractual, daily wage/casual, seasonal and self-employment).

Land Ownership and Tenure Security

Table 4 depicts landholding status.

Table 4: Household Land Ownership

Landholding Category	Percentage (%)
No land	48.8
< 1 acre	28.6
1–2 acres	14.1
> 2 acres	8.5

Data Source: Primary Household Survey, 2024.

Land dispossession emerges as a key challenge due to industrial acquisition, commercial real estate pressure and incomplete implementation of the Forest Rights Act.

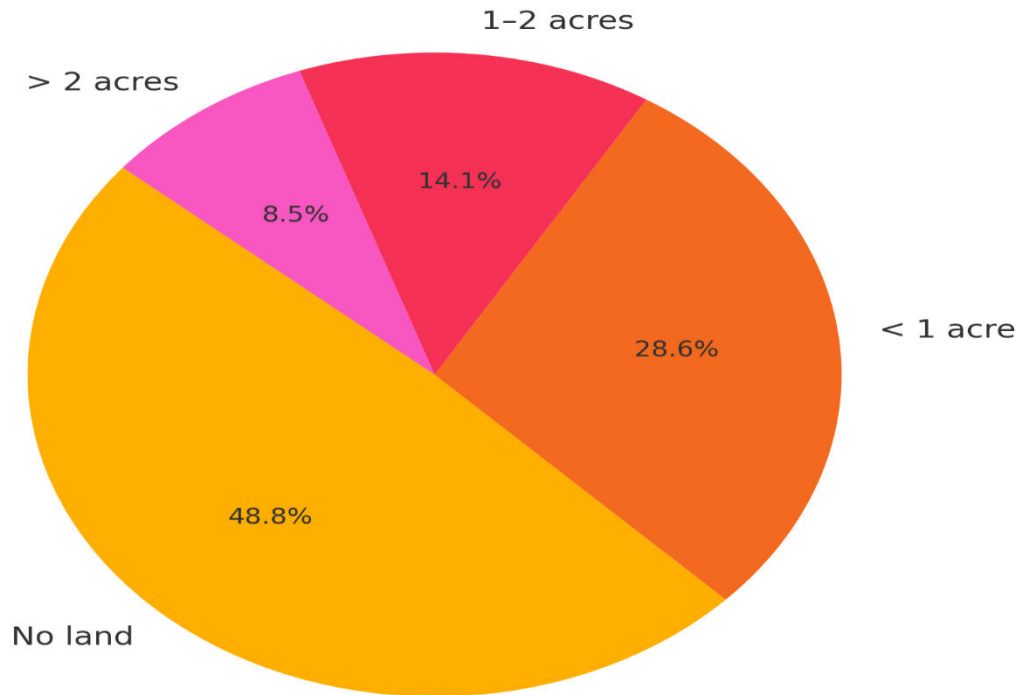


Figure 4: Distribution of land ownership among tribal households by landholding category (no land, < 1 acre, 1-2 acres, > 2 acres).

Migration Trends

Table 5 shows rising labour migration patterns.

Table 5: Migration Type and Frequency

Migration Type	Percentage (%)
No migration	26.4
Seasonal migration (1-3 months)	44.5
Temporary migration (4-9 months)	19.8
Permanent migration	9.3

Data Source: Primary Household Survey, 2024.

Migration is driven primarily by unstable earnings and declining resource-based livelihood security.

Access to Public Services

Table 6 shows access levels to essential services.

Table 6: Proportion of Households with Access to Public Services

Service Category	Accessible (%)	Not Accessible (%)
Primary school	76.4	23.6
Secondary school	46.2	53.8
Primary healthcare centre	52.1	47.9
Banking & financial services	34.4	65.6
Public transportation	58.3	41.7
Clean drinking water	61.8	38.2
Sanitation facilities	42.5	57.5

Data Source: Primary Household Survey, 2024.

Service accessibility improves closer to urban centres, but interior settlements suffer significant deprivation.

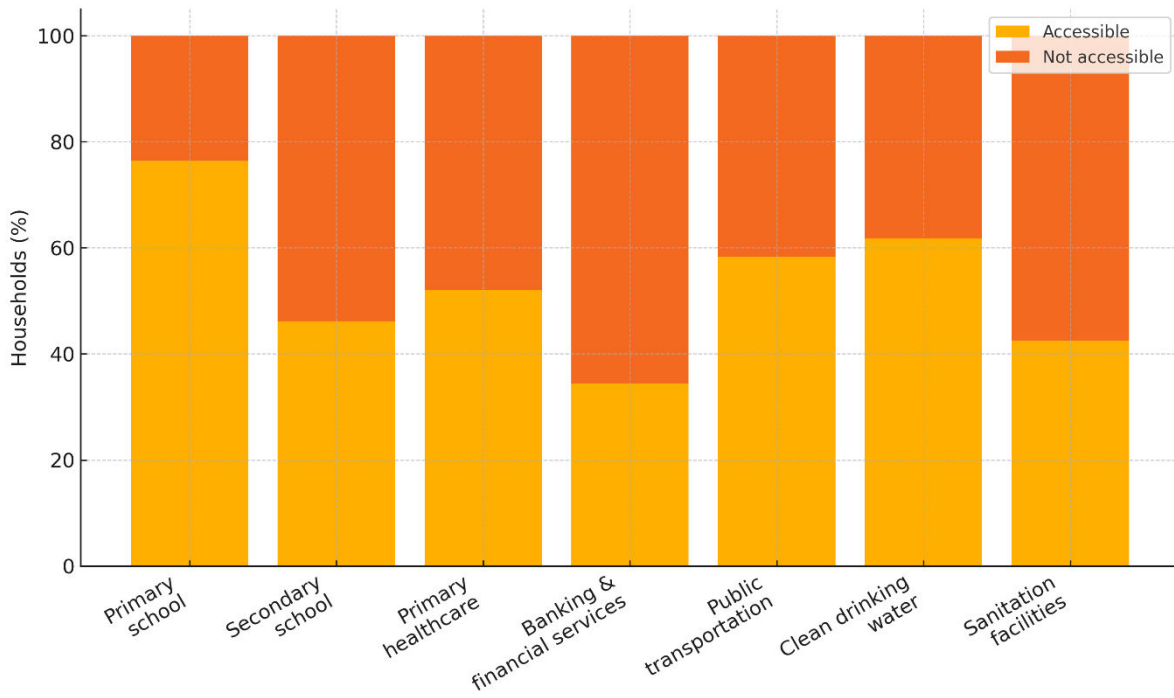


Figure 5: Access and non-access to key public services (education, healthcare, financial services, transport, water and sanitation) among tribal households (in percentage of households).

Gender-Based Vulnerabilities

Table 7 highlights gender-specific impacts and vulnerability exposure.

Table 7: Gendered Impacts (% of Respondents Reporting Experience)

Impact Domain	Women (%)	Men (%)
Harassment/discrimination at workplaces	21.3	6.8
Wage disparity	34.1	5.2
Increased unpaid domestic burden	72.5	11.3
Safety concerns during travel to work	48.8	9.4

Data Source: Focus Group Discussions & Key Informant Interviews, 2024.

The findings demonstrate that industrial integration has intensified gendered inequities.

Ecological and Resource Access Changes

Table 8 summarises environmental decline based on community perception.

Table 8: Perceived Environmental Change (Last 10 Years)

Indicator	Significant Decline (%)	Moderate Decline (%)	No Change (%)
Forest cover	61.2	28.5	10.3
River/stream water availability	54.6	33.1	12.3
Wildlife conflict	42.8	31.4	25.8
Groundwater level	57.3	30.0	12.7

Data Source: Household Survey & GIS Analysis, 2024.

Spatial GIS assessment corroborated the community reports, showing a 19.8% decline in tree cover and 28.4% increase in industrial land use since 2002.

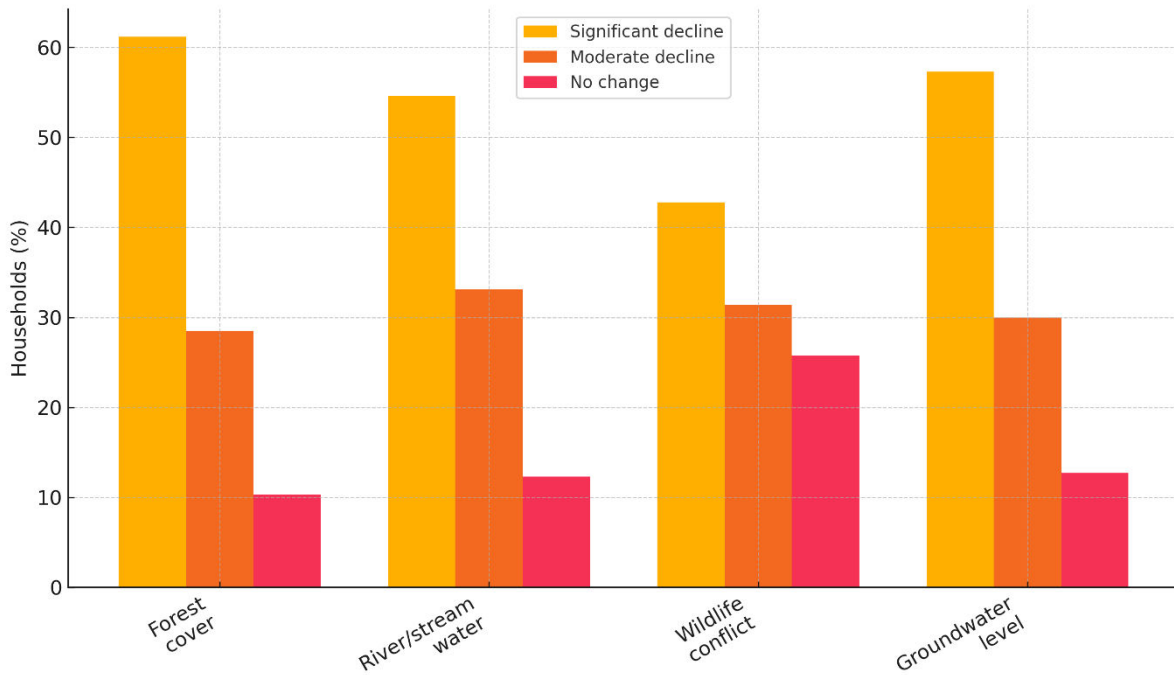


Figure 6: Perceived environmental change over the last decade in forest cover, river/stream water availability, wildlife conflict and groundwater levels among tribal households.

Overall Impact Assessment

Table 9 aggregates perceived impacts of urban-industrial expansion.

Table 9: Overall Community Perceptions

Impact Category	Positive (%)	Negative (%)
Employment opportunities	63.7	36.3
Cost of living	18.9	81.1
Cultural identity & traditions	12.4	87.6
Community cohesion	15.2	84.8
Environmental quality	9.8	90.2

Data Source: Household Survey, 2024.

The findings indicate that although job access improved, losses in cultural identity, environmental security and social well-being are substantial.

DISCUSSION

The results demonstrate a clear transition from traditional subsistence livelihoods toward urban-dependent wage employment driven by industrial development pressures. However, increased income potential is offset by precarious working conditions and rising living expenses. Loss of land, declining forest resources, and inadequate governance of industrial expansion have weakened tribal autonomy and sustainability. Migration is now a structural survival strategy. Access to services improves nearer urban areas, but inequalities persist for remote settlements. Women and youth bear disproportionate social burdens. Ecological degradation emerges as a critical determinant shaping livelihood vulnerability.

Collectively, these findings illustrate the contradictory nature of India’s development model, reinforcing research gaps identified in academic literature and confirming the need for community-centred planning frameworks.

CHALLENGES, POLICY IMPLICATIONS AND FUTURE RESEARCH DIRECTIONS

Challenges

The findings highlight a set of interconnected challenges faced by tribal settlements in Coimbatore as a result of rapid urbanization and industrial expansion. First, land alienation and insecure tenure emerge as one of the most critical threats. Nearly half of surveyed households lack legal land ownership, and community testimonies indicate increasing pressure from industrial estate development, real-estate speculation, and infrastructure expansion. Inadequate or delayed implementation of the Forest Rights Act (FRA) and difficulties in securing community forest resource rights further intensify tenure uncertainty. Loss of access to traditional commons such as forests, grazing lands, river systems and minor forest produce sources has directly weakened subsistence practices and cultural continuity.

Second, precarious employment conditions represent a major challenge. The shift to construction and industrial wage labour has

not translated into stable livelihood security as over half of tribal workers remain dependent on daily wage contractual employment. Hazardous working conditions, insufficient occupational safety measures, wage discrimination, and exploitation by labour contractors are recurrent experiences. Limited formal education and skill training restrict tribal workers' access to formal sector employment, reinforcing intergenerational poverty traps.

Third, socio-cultural disruption is evident. The rapid disintegration of traditional knowledge systems, social institutions, and internal governance mechanisms has eroded community cohesion. Cultural identity is increasingly threatened by urban assimilation pressures, stigma, discriminatory experiences in workplaces and public spaces, and the stagnation of language and rituals due to youth migration. These challenges are especially acute for women, who face heightened vulnerability related to workplace harassment, wage inequality, and the expanding burden of unpaid domestic labour.

Fourth, infrastructural and public service disparities persist across settlements. Despite proximity to an industrialized urban centre, tribal communities continue to face inadequate access to safe drinking water, healthcare, sanitation, secondary education and financial services. Limited transport connectivity restricts mobility and emergency access. Bureaucratic exclusion from welfare schemes, lack of information and documentation challenges further marginalize households.

Fifth, ecological degradation linked to development-driven land conversion contributes significantly to livelihood instability. Reduction of forest cover, declining water levels, increased human-wildlife conflict and pollution from industrial effluents have impacted both food security and environmental health. Climate variability, altered rainfall patterns and heat stress have further disrupted traditional agriculture and foraging practices.

Collectively, these challenges reveal that despite developmental rhetoric, current growth trajectories disproportionately disadvantage Indigenous communities and reproduce structural inequality.

Policy Implications

The evidence demonstrates the necessity for a paradigm shift in regional development planning to prioritise Indigenous rights and socio-ecological sustainability. Policy implications include:

- Strengthening tenure security and land rights implementation: fast-tracking individual and community land patta distribution under FRA, preventing illegal land acquisition, creating transparent land-use governance frameworks and recognising community stewardship of forest resources.
- Ensuring labour rights and social protection: enforcing occupational safety regulations, establishing labour monitoring mechanisms within industrial clusters, expanding skill-development programs tailored for tribal youth, and guaranteeing minimum wage compliance and access to employment insurance.
- Enhancing access to essential public services: integrating tribal settlements into comprehensive development plans, improving health outreach systems, strengthening school infrastructure and transport connectivity, and promoting digital and financial literacy to support financial inclusion.
- Community-centred governance: institutionalising participation of tribal leaders and women representatives in panchayat-level planning, ensuring culturally responsive development interventions, and utilising traditional knowledge systems in environmental management.
- Ecological conservation and resource protection: implementing landscape-level conservation strategies, enforcing pollution regulations for industrial units near ecologically sensitive zones, restoring degraded forests and river systems, and establishing compensation and mitigation frameworks for human-wildlife conflict.
- Cultural and linguistic preservation: supporting tribal cultural centres, language revitalization initiatives, heritage documentation and community-based education that integrates Indigenous knowledge.

Future Research Directions

The study identifies the need for further interdisciplinary research to deepen understanding and inform action. Potential areas include:

- Longitudinal studies examining intergenerational livelihood transition and the effects of prolonged industrial exposure on health and cultural identity.

Gender-specific research addressing women's safety, labour rights, empowerment and psychosocial well-being.

Detailed GIS-based modelling of landscape transformation, forest fragmentation and hydrological impacts linked to industrial expansion.

Comparative studies of policy implementation effectiveness across different tribal regions in South India to identify replicable models of participatory governance.

Economic evaluation of community-led resource management and alternative livelihood models rooted in ecological sustainability.

Mental health and social resilience studies to capture less visible psychological impacts of displacement and marginalization.

A community-driven research approach rooted in participatory frameworks is essential to produce actionable outcomes and counter the persistently top-down development narratives that dominate mainstream policy spaces.

Section VI synthesizes the structural challenges, policy requirements and knowledge frontiers emerging from the study. It highlights the need for a rights-based, inclusive, and ecologically embedded development paradigm that recognises tribal agency rather than treating Indigenous communities as residual beneficiaries of industrial growth.

CONCLUSION

This study has demonstrated that rapid urbanization and industrialization in Coimbatore have generated complex and often contradictory consequences for tribal settlements situated within peri-urban and forest-fringe landscapes. While the expansion of industrial employment and improved access to selected public services have created new opportunities, these gains are overshadowed by significant challenges including land alienation, precarious wage labour, socio-cultural disruption, gendered vulnerabilities and environmental degradation. The findings clearly show that the transformation from subsistence-based livelihoods to urban-dependent labour has intensified economic insecurity and eroded tribal autonomy, identity and ecological stability.

The study underscores the urgent need for development planning grounded in Indigenous rights, participatory governance and community-centred ecological management. Policies must prioritise secure land tenure, labour protection, equitable access to essential services and cultural preservation. Without such shifts, current development trajectories risk deepening marginalization and jeopardising both social justice and environmental sustainability. The research highlights the importance of holistic interdisciplinary approaches and continued empirical investigation to support sustainable and inclusive regional development that recognises tribal communities as rightful stakeholders rather than peripheral beneficiaries of economic growth.

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