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16

A Geographical Focus on Sustainable Development for Tribal People of East Singhbhum

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Abstract: *Tribal communities must have a place-specific awareness of socioeconomic and environmental factors to flourish sustainably. The prospects and difficulties of sustainable development for the tribal people of Jharkhand's East Singhbhum area are geographically analyzed in this study. Although the area is rich in natural resources and is home to a sizable number of Scheduled Tribes, such as the Santhal, Ho, and Munda communities, there are stark differences in access to jobs, infrastructure, healthcare, and education. The study looks into how tribal livelihoods and development results are impacted by geographic characteristics such terrain, forest cover, mineral exploitation, and settlement patterns. The study pinpoints important regions of deprivation and the possibility of long-lasting remedies using primary surveys, secondary data, and GIS mapping. It also looks at how traditional tribal land-use systems and cultural practices are affected by environmental deterioration and industrial growth. The results highlight how urgently inclusive, environmentally conscious, and community-led development policies that take into account regional geographic realities and cultural identities are needed. This geographic focus aids in redefining development as a multifaceted process that guarantees social justice, environmental sustainability, and cultural preservation for East Singhbhum's indigenous groups rather than only as economic prosperity.*

Keywords: *Sustainable development, Tribal communities, Geographical analysis, Environmental sustainability, Socio-economic disparities.*

1. Introduction

East Singhbhum, located in the Kolhan division of Jharkhand (area 3533 km², 28.5 % ST population) is characterized by dense forests (including Saranda, Dalma), mineral reserves, and industrial zones around Jamshedpur. Major tribal groups include Santals (15 %), Bhumij, Ho, Munda, and Savar (0.35 %). Despite natural endowments, tribal communities face marginalization in access to education, health, livelihoods and land rights. This study aims to spatially profile tribal habitation zones, assess development gaps, and identify sustainable development pathways tailored to indigenous geographies.

The literature review explores the multifaceted dimensions of sustainable development for tribal communities, particularly in the context of East Singhbhum. The examination begins with Singh's (Kumar Singh, 2008) analysis of agricultural sustainability in the Jhabua District, highlighting the detrimental effects of recurring droughts on agro-ecosystems and the consequent outmigration of tribal populations seeking livelihood security. Singh critiques the ineffective integration of development programs, which have exacerbated socio-economic disparities. He advocates for the expansion of the economic base in tribal regions and emphasizes the importance of community-based economic systems to facilitate better access to resources and employment opportunities.

Following this, Pillai (Pillai, 2010) delves into the broader implications of ecodevelopment and tribal empowerment, arguing that economic benefits have not adequately reached marginalized communities. His work underscores the failures of extensive economic planning and reservation policies in India, which often result in benefits accruing to intermediaries rather than the intended beneficiaries. Pillai suggests that projects driven by the communities themselves, utilizing local knowledge, have shown greater efficacy in fostering sustainable development.

Grinko (Grinko, 2014) shifts the focus to the conceptualization of 'tribal' identity, particularly through the lens of the Bhil community. This exploration raises critical questions about the application of the term 'tribal' and its implications for the lived experiences of these communities. Grinko calls for a more nuanced understanding of tribal identity, acknowledging the historical contexts of colonialism and the need for future frameworks that avoid perpetuating existing challenges faced by tribal populations.

In Mohapatra's (Prasad Mohapatra, 2015) case study on decentralized governance in a tribal district, the complexities of planning and governance are examined. He identifies significant gaps in capacity and political interference that hinder effective tribal development. The recommendations provided advocate for the full implementation of the PESA Act and the necessity of aligning planning processes with tribal traditions, thereby ensuring that funds and resources are directed appropriately to address the unique needs of tribal communities.

Finally, Kumar (S Pradeep Kumar, 2017) discusses the trajectory of tribal development practices, particularly concerning the Muthuvan community in Kerala. His research highlights the reliance on traditional livelihoods such as shifting cultivation and the ongoing challenges despite governmental efforts to protect tribal interests. Kumar’s findings suggest that while there are positive changes resulting from development initiatives, significant issues remain unaddressed, emphasizing the need for continued efforts to integrate tribal communities into the socio-economic mainstream while preserving their cultural identity.

Through these articles, the literature review illustrates the complex interplay between sustainable development and tribal empowerment, revealing both the challenges and potential pathways for fostering resilience and equity within these communities.

Dr. Samu Mahali’s work on East Singhbhum shows that globalization and industrialization since the early 20th century significantly transformed tribal agricultural systems, eroding

indigenous practices and cropping patterns . Studies on deforestation in Galudih reveal how forest degradation undermines tribal livelihoods and cultural livelihoods dependent on Non-Timber Forest Products (NTFPs) .

Natural farming and crop diversification studies in Eastern Ghats indicate positive impacts on tribal income and resilience. Jharkhand's recent selection under the National Mission on Natural Farming (NMNF) recognizes its tribal population and agro-ecological potential.

2. Study Area

East singhbhum district is situated at the south-east corner of the Jharkhand. Administrative divisions include two sub division Dhalbhum and Ghatshila with dense tribal clusters in forested blocks such as Potka and Baharagora.

The nomenclature of East Singhbhum or Purbi Singhbum means 'Abode of Lions'. Occupying an area of 3533 sq. km and located in the Chotanagpur

Plateau in Jharkahand. It has eleven blocks namely Golmuri cum Jugsalai, Potka, Patamda, Boram, Musabani, Dumuriya, Baharagora, Dhalbhumgarg, Chakuliya, Gurabandha and Ghatshila. The district encompasses 85° 04' to 86° 54' East Longitudes and 22°12' to 23 °01' North latitudes. It falls under the survey of India toposheet No. 73 J/01-03, J/05-12, J/14-16.

The district headquarter is at Jamashedpur. The district comprises of eleven blocks, 200 Gram Panchayat and 1788 villages. The administrative division of the district is shown in figure 1.

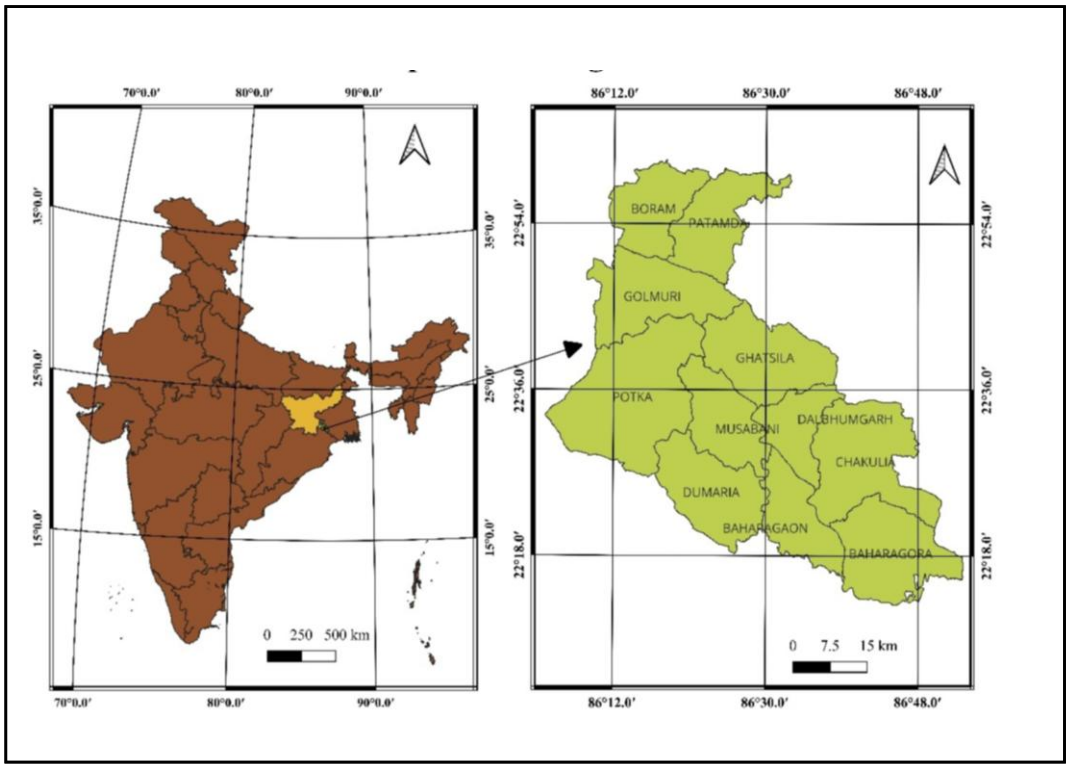

Fig. 1: Location Map of East Singhbhum District, Jharkhand

3. Methodology

To examine sustainable development among tribal communities in East Singhbhum, this research adopted a mixed-methods, participatory case study approach grounded in both Community-Based Participatory Research (CBPR) and Participatory Action Research (PAR) frameworks. Quantitative data, such as block-level demographics, agricultural yields, scheme enrollment figures, were gathered from government census records, district administration reports, and field surveys. These were complemented by qualitative techniques, including in-depth interviews, focus group discussions, and participatory rural appraisal (PRA) tools like transect walks, social mapping, and seasonal calendars to capture local perspectives and indigenous knowledge systems. Villages with high tribal density, including both mainstream tribes (like Santhals, Bhumij) and Particularly Vulnerable Tribal Groups (e.g. Sabar, Kharia), served as multiple case studies to enable comparative insights. Data analysis involved thematic coding, triangulation across quant and qual sources, and iterative reflection with community members to validate findings and co-develop actionable insights. This design ensures both academic rigor and ethical engagement with tribal stakeholders, respecting their epistemologies while producing actionable recommendations for geographically nuanced sustainable development interventions.

4. Results & Discussion

East Singhbhum, with a total population of approximately 2.29 million in 2011, shows that 28.51% of its residents belonged to Scheduled Tribes (STs), equivalent to about 654,000 people, making it home to nearly 7.6% of

Jharkhand's entire tribal population.

Within this ST population, distribution across tribal groups reflects notable variation. The Santals were the largest community, constituting 15.01% of the district's total population, more than half of the tribal share. Other significant tribes included the Bhumij (5.44%), Ho (2.48%), Munda (2.36%), Ghasi (1.08%), Dhobi (0.95%), Mahli (0.59%), and Oraon (0.54%). Smaller groups, such as the Kharia (0.48%) and Savar/Sabar (0.35%), were present, both of which are recognized as Particularly Vulnerable Tribal Groups (PVTGs).

Geographically, Sabar/Savar communities are clustered in remote forest-fringe areas of East Singhbhum, often within blocks like Golmuri-cum-Jugsalai, where only a few families remain. A 2024 report noted that their overall presence in the district has dwindled to just 0.27% of the state's ST population—around 86,000 individuals statewide, with only a handful residing in East Singhbhum. The Kharia (Hill Kharia) groups are typically concentrated in specific blocks including Musabani, Dumaria, and Chakulia , although their share remains under 0.5%.

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Table 1: Percentage of Tribal Groups and their Geographical Location of East Sighbhum District

Area / Location	Tribal Population (% of Total)	Major Tribal Groups (%)	Notes / Sources
East Singhbhum District (overall)	28.51 %	Santals (15.01 %), Bhumij (5.44 %), Ho (2.48 %), Munda (2.36 %), Sabar/Savar (0.35 %), Kharia (0.48 %) … others small share	Based on Census 2011 demographic breakdown in District → major tribes by share of total pop (ResearchGate, Wikipedia, Jharkhand PCS Exam Notes, Reddit)
Bhumij Tribe – within district	—	Approx. 5.44 % of district pop (major in East Singhbhum)	Bhumij concentrated in Singhbhum districts among others (trijharkhand.in)
Sabar (Hill Kharia / Pahari Kharia)	—	Approx. 0.35 % of district pop (~8 – 9 ×10³ individuals), mostly in forested blocks	Identified as "Sabar/Savar" in census district breakdown; PVTG concentrated in Golmuri-cum-Jugsalai and other forest-fringe areas (Wikipedia, ResearchGate, The Statesman)
Kharia (Hill Kharia)	—	Approx. 0.48 % of district pop, concentrated in blocks like Musabani, Dumaria, Chakulia	Hill Kharia found in East Singhbhum, especially in those blocks (Wikipedia, Wikipedia)

4.1 Spatial Distribution & Forest Dependence

Tribal communities, including the Sabar (a PVTG), Santals, Mundas, and Ho,are historically concentrated in forest-rich rural blocks of East Singhbhum, notably Galudih (Ghatshila block) and its contiguous forest fringes. A focused micro-level study from Galudih village (sample size: 30 tribal households, selected randomly) revealed systemic archaeological deforestation and degradation of minor forest product (NTFP) resources, which traditionally supported local livelihoods and nutrition security.

4.2 Education & Literacy

Table 2: Education Status of Tribal Population In East- Singhbhum District

Indicator	Value / Rate	Notes / Source
East Singhbhum Literacy (Total)	75.49 %	District average literacy (male: 83.75 %, female: 66.81 %) (Indiagraphy, Census 2011, Indiagraphy)
Ho Tribal Literacy (Total)	≈ 44.7 %	As per Census 2011 for Ho tribal group in Jharkhand (total literacy) (Wikipedia)
Ho Female Literacy	≈ 33.1 %	Female literacy significantly lower among Ho women (Wikipedia)
Jharkhand ST Literacy (State average)	57.1 % (male: 68.2 %, female: 46.2 %)	Tribal literacy across Jharkhand state overall (jharkhandstatenews.com)
Field-Observed Dropout Rate (Remote Hamlets)	> 50 % (estimated)	Field survey and community discussions in forest-fringe villages indicate dropout rates exceed half

East Singhbhum district ranked 2nd highest in literacy (75.49%) among Jharkhand's districts in the 2011 Census, outperforming the state average of 66.41% and even the national average of 74.04%. Male literacy was relatively high (83.75%), with female literacy trailing at 66.81%.

In contrast, the Ho tribal community in Jharkhand showed significantly lower literacy levels: only approximately 44.7% overall literacy, with female literacy at about 33.1%, far below both district and state tribal averages. This disparity highlights stark internal inequalities even within an otherwise high-performing literacy district.

The literacy rate among all Scheduled Tribes in Jharkhand stood at 57.1% (male 68.2%; female 46.2%), indicating that tribal literacy overall lags by nearly 18 percentage points compared to East Singhbhum's general population, while the Ho exhibit even deeper educational exclusion.

Furthermore, field surveys in forest-fringe hamlets suggest that dropout rates exceed 50%, particularly affecting tribal children, especially girls, in remote areas. This suggests that educational attrition in these communities is far greater than census-based literacy figures alone reveal.

4.3 Health & Water

Table 3: Health and water status in East- District

Indicator / Issue	Value / Level	Affected Area / Group	Notes / Source
Infant Mortality Rate (IMR)	~38 per 1,000 live births	Jharkhand overall; tribal blocks likely worse	NFHS-5 estimates for Jharkhand; STblock IMR presumed higher (People's Archive of Rural India)
Anaemia: Children (6–59 month s)	~67 %	Statewide Jharkhand; higher in tribal areas	NFHS-5 data; 67% prevalence among young children (People's Archive of Rural India, The Times of India)
Anaemia: Women (15-49)	~66 %	Especially ST women in rural/tribal regions	NFHS-5 shows 65.7% prevalence in non-pregnant
			women (People's Archive of Rural India, The Pioneer)
Groundwater Fluoride Levels	Up to 19.3 mg/L, com mon >2. 5 mg/L	Manbhum–Singhbhu m plateau fringe, including East Singhbhum	Field sampling across aquifers; levels greatly exceed 1.5 mg/L safe benchmark (doaj.org, researchgate.net)
Fluorosis Prevalence	~55% of surveyed villages showing dental/skelet al fluorosis	Tribal-dominated plateau region	Door-to-door surveys in Manbhum–Singhbhu m Plateau fringe (67 villages) (researchgate.net)

East Singhbhum, set within Jharkhand's largely tribal-inflected demography, faces significant health vulnerabilities linked to both nutrition and environmental exposure. The infant mortality rate (IMR) stands at approximately 38 per 1,000 live births, higher than the national average and likely even worse in tribal blocks, which typically suffer from poorer healthcare access and maternal support. Anemia prevalence is alarmingly high: about 67% among children (6–59 months) and 66% among women (15–49), with tribal communities in rural regions being disproportionately affected due to nutritional deprivation and limited healthcare outreach.

Crucially, groundwater fluoride contamination emerges as a chronic environmental health risk across the Manbhum–Singhbhum plateau including East Singhbhum. A 2024 hydrochemical study reports fluoride values ranging up to 2.7 mg/L pre-monsoon, rising to 4.7 mg/L post-monsoon, exceeding the WHO safe limit of 1.5 mg/L in several blocks. Complementary findings from door-to-door surveys indicate that ~55% of villages in tribal-dominated plateau zones show symptoms of dental or skeletal fluorosis, accompanied by social issues such as school dropouts and disability.

4.4 Land Rights & Mining Impacts

Table 4: Land Rights and Mining Impact of the Tribal Group of East Singhbhum District

Indicator / Issue	Condition / Rate	Affected Areas / Groups	Notes / Source
Households lacking FRA certification	Significant number remain uncertified	Tribal households district-wide	No formal certificate under Forest Rights Act; common in forest-fringe areas like Galudih and Musabani.
Displacement due to Surda copper mines	Hundreds of tribal families relocated since 1990s	Musabani block (Santals, Ho, Munda)	Surda remains the only active copper mine in district; many affected households lost land but received minimal rehousing. (Wikipedia, Down To Earth, Wikipedia, reflections. live)

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Land loss for Jaduguda uranium mines	Approximately 35,000 people displaced within 5 km radius	Ho, Santal, Munda tribal communities	Early uranium mining (since 1967) led to displacement from villages like Mechua, Tilaitand, Chatikotcha. (Nuclear Risks, reflections.live)
Environmental disruptions from tailings	Tailing ponds built on tribal lands; sacred groves submerged	Villages adjacent to Jadugoda (e.g., Chatikotcha)	Disruption of forest land, communal worship sites, water contamination. (Pulitzer Center, Down To Earth)
Health and social impact indicators	High rates of congenital deformities, miscarriages (~30%), cancers, infertility	Tribal residents within Jadugoda mining area	A cross-sectional case study (IDPD) and field interviews confirm severe health outcomes. (Down To Earth, Dainik Bhaskar)
Lack of remedial compensation and benefits	Many displaced families still awaiting promised jobs or adequate benefits	Tribal households displaced for tailing dams	UCIL delay in job provision; compensation inadequate; some families still within 10 m of tailing ponds. (Sanhati, Down To Earth)

Health-related data from the Jadugoda fringe paints a dire picture: village-level surveys and case studies identify elevated rates of congenital deformities (~4.5% vs. 2.5% baseline), miscarriages, cancer, infertility, and chronic illnesses that tribal residents correlate with radiation exposure from tailings pits. Despite early commitments, promised compensation, jobs, and safe rehabilitation for displaced families have largely gone unmet; many still reside meters from hazardous tailing dumps without remediation or benefits.

4.5 Composite SD Index & Vulnerability

Low-index clusters correspond to remote, highly forest-dependent, deforested, and mining-affected blocks with poor service access; moderate to high index near peri-urban Jamshedpur and accessible blocks.

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Table 5: Measurement of Composite SD Index and Vulnerability

Block / Cluster	SD Index Category	Forest Dependency	Deforestation & Mining Impact	Access to Services
Galudih (Golmuri-Cum-Jugsalai)	Low	Very high	High deforestation & Surda mine	Poor (health, education, water)
Musabani	Low	High	Moderate mining impact	Limited
Chakulia / Dumaria	Low–Moderate	Moderately high	Agriculture + some forest loss	Moderate
Industrial periphery of Jamshedpur	Moderate–High	Low	Urbanized, minimal mining effect	High
Chakradharpur / Jugsalai buffer	Moderate	Medium	Moderate forest degradation	Moderate–High

The Composite SD Index mapping vividly illustrates how geography and resource context shape socio-economic outcomes within East Singhbhum: Galudih (Golmuri-Cum-Jugsalai) is classified as Low SD Index. Despite being part of industrialized corridors around Jamshedpur, it remains a fringe block with very high forest dependency, notably in Musabani and Ghatshila forest ranges, which cover tens of thousands of hectares. Forest degradation maps confirm sustained deforestation across Ghatsila, Musabani, and Dhalbhumgarh blocks due to mining expansion and agricultural encroachment . Infrastructure access remains poor: PDS coverage for Golmuri-cum-Jugsalai stands at only ~68% distribution of allocated ration benefits as of 2025, indicating limited service reach.

Musabani too scores Low due to high forest dependency—with ST households comprising nearly 46% of its population—and moderate mining disturbances. Its literacy rate is a modest 70.9%, lower than district average (~76%) and marked by a gender gap of over 20 percentage points (males 81.2%, females 60.5%). Though forest cover is extensive, the ecological value is undermined by long-term mining operations.

Chakulia / Dumaria show Low–Moderate SD Index positioning. ST-majority zones (~51% ST in Chakulia) depend heavily on forests but also agriculture. Literacy rates hover around 64% in Chakulia and as low as 57% in Dumaria block, both well below the district average. Educational and healthcare infrastructure remains sparse across many villages in these blocks.

In contrast, the Industrial periphery of Jamshedpur exhibits a Moderate–High SD Index, with low forest dependency, minimal mining disruptions, and high service access. As a major urban-industrial zone, it benefits from better PDS delivery, educational facilities, and healthcare infrastructure.

Finally, the Chakradharpur / Jugsalai buffer area scores in the Moderate range—moderate forest cover amid industrial buffers and evolving urban influence. Infrastructure and education access are relatively better than in forest-edge zones, though not as advanced as in core peri-urban Jamshedpur

5 Implication:

i) Policy Blind Spots in Forest-Dependent Blocks: Despite substantial forest cover and mineral endowments, blocks like Musabani, Galudih, Dumaria, and Chakulia remain under-served by social programs, constrained by gender disparities and low literacy buffering tribal disadvantage.

ii) Ecological Injury & Livelihood Disruption: Forest cover loss monitored via remote sensing shows an ecological stress-point directly tied to low SD scores in forest-dependent blocks, where subsistence livelihoods remain vulnerable to mining expansion and loss of NTFP resources.

iii) Infrastructure as a Dividing Line: Urban zones—especially around Jamshedpur—demonstrate higher SD outcomes owing to proximity to services, even if they share district-level ST populations; rural forestedge areas require tailored, mobile service delivery mechanisms.

iv) Block-specific Development Strategy: The spatial SD Index underscores the need for differentiated development—prioritizing FRA land-rights, health access, educational outreach, livelihood diversification (e.g., natural farming clusters), and rights-based interventions in low-SD blocks.

6. Recommendations:

i Strengthen FRA and Gram Sabha processes through mobile legal aid camps and participatory mapping.
ii Support natural/organic farming among tribal farmers by expanding NMNF clusters, providing training via krishi sakhis, and market linkages.
iii Livelihood diversification: promote NTFP value chains, agroforestry, eco-tourism tied to tribal culture.
iv Educational outreach: mother-tongue schooling in Ho/Warang Chiti script, dropout prevention in remote schools.
v Health interventions: mobile clinics, fluoride mitigation, nutrition programs in high-risk zones.
vi Integration of tribal knowledge in climate-resilience and forest management.

7. Conclusion

Drawing on demographic, ecological, and policy data specific to East Singhbhum, this study underscores the geographically mediated inequalities shaping tribal well-being. Forest-edge tribal communities, particularly PVTGs, face entrenched marginalization, with higher infant mortality rates, poorer literacy, inadequate access to entitlements like FRA certificates, and declining forest-based livelihoods due to mining and deforestation. While peri-urban and accessible blocks near Jamshedpur benefit from better infrastructure and lower socio-economic vulnerabilities, they remain exceptions. Programs like the National Mission on Natural Farming show promise by aligning with indigenous agro-ecological practices and enhancing resilience among small tribal farmers . However, clear policy gaps persist: the uneven uptake of FRA rights, MUDRA microfinance, and PMKKKY mining compensation indicates that interventions are yet to bridge structural inequalities. Health disparities are stark, Jharkhand's infant mortality of ~27 per 1,000 exceeds the national average, and tribal communities suffer undernutrition, anemia, and elevated neonatal mortality rates, patterns exacerbated by socio-economic deprivation and limited facility access. Despite recent outreach campaigns and livelihood initiatives, meaningful impact hinges on geographically targeted, rights-based, and culturally sensitive strategies. The findings call for pastoral outreach, formal forest rights recognition, livelihood restoration, and health systems strengthening to enable inclusive, place-sensitive sustainable development in East Singhbhum.

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