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RESEARCH ARTICLE

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INFRASTRUCTURE DEVELOPMENT IN TRIBAL AREA: A STUDY OF SHAHDOL DIVISION OF MADHYA PRADESH

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ABSTRACT

The infrastructure development in tribal dominated areas in India has been one of the most apex agendas of the various governments. After the independence, the various governments during different course of time have tried their level best to make the tribes of India joining the common society and citizens of the nations. But the tribes of India are still considered as backward on the various criteria & socio-economic development indicators. There are less means of communication in tribal areas, lack of proper drinking water, illiteracy; inadequate medical facilities are some of the major infrastructural problems that the tribes of India are facing for a long time. The preparations and implementation of the plans for the infrastructure development in tribal areas shall be in accordance with the acceptance of responsibility of development of tribal dominated parts of the nations. During the course of infrastructure development in these tribal areas some new problems have emerged and the existing ones have assumed new dimensions leading to significant changes in the concept and strategies for wellbeing of tribals in India. Tribes encounter socio-economic, cultural and political problems as they are considered as a weaker section of the society but the Indian tribes are facing some unsolved problems. The present paper is an attempt to focus upon the basic problems and obstacles faced by the tribes in India and provide with possible solutions for them through proper and sustainable infrastructure development.

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INTRODUCTION

Planning is generally accepted in many developing countries as an indispensable means to promote development and the preference for it arose out of the inability of the poor and traditional societies to imitate and promote development process on one hand and the desire of the state to put an immediate end to human sufferings on the other (Suresh, 2014). The development of the tribes of India is been one of the apex agenda of the various government of the India, since the independence (Ravikumar, 2018). Several works have been done for the welfare of tribes and rising up their standard of living by providing them infrastructural facilities for their economic empowerment (Naik & Panda, 2023). The tribal natives of India are considered economically & socially backward and the major reasons behind this prevailing condition is considered such as low literacy, improper & unbalance development of infrastructure facilities i.e.-lack of power supply, drinking water sources, health-care facilities, traditional agricultural techniques, lack of creativity, and non-availability of quality higher education opportunities (Vajiram, 2026). It is a matter of fact that still the tribes of India are not developed upto the expectation due to various reasons and non-functioning of government's schemes & policies on the ground level

(Saxena, 2020). This study has been diverted in such a pattern so as to find out the actual current scenario and key problems of the tribes, reasons behind the prevailing condition along with the possible solutions and its welfare related measures. Shahdol division in Madhya Pradesh, encompassing districts like Shahdol, Umaria, Anuppur and Dindori is predominantly tribal with groups such as Gonds and Baigas forming a significant portion of residents. Despite post-independence efforts, tribal areas here face persistent infrastructure deficits in roads, water, electricity, health, and education, hindering integration into mainstream development. This study assesses the current state of infrastructure at the block level across division to identify gaps and propose solutions for empowerment. The research addresses key objectives: measuring available facilities, evaluating problems, and suggesting improvements tailored to tribal needs. By focusing on block-level realities, it highlights how inadequate infrastructure perpetuates poverty, low literacy, and limited opportunities in this mineral-rich yet underdeveloped region.

Objectives of the study

The objectives of this study of infrastructure development of tribes are very determined and the whole research has been focused on these objectives.

The major objectives of this study are as mentioned below:

- To measure the development level of infrastructural facilities available to the tribes.
- To check the actual prevailing condition and major problems of the tribes.
- To determine the possible reasons and factors behind existing conditions and accessing possible solutions for betterment and empowerment of the tribes.

LITERATURE REVIEW

The infrastructural development of tribal regions in Madhya Pradesh has remained a significant concern for policymakers and development scholars, as the state is home to one of India's largest Scheduled Tribe populations. (Tribhuwan ,2005) provided a foundational comparative study of tribal housing issues across four states including Madhya Pradesh, examining traditional tribal housing layouts alongside the status of government housing schemes, and highlighted the persistent tension between state-provided housing and indigenous architectural traditions. Recent government initiatives have attempted to address housing deficits through large-scale programs such as the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM JANMAN), launched in November 2023, which includes provisions for pucca houses for Particularly Vulnerable Tribal Group (PVTG) households, with official data indicating that while the target was 4.9 lakh houses, 3,96,340 had been sanctioned by mid-2025 (Government of India, Ministry of Tribal Affairs, 2023, 2025). (Bhatnagar, 2024) designed for a tribal school in Dhar district demonstrated how vernacular architecture principles—utilizing bamboo, stone, and thatch with integrated rainwater harvesting and solar energy—can create culturally appropriate infrastructure, representing a departure from standardized government housing models toward context-sensitive design. Water infrastructure in tribal areas has received considerable attention following the Jal Jeevan Mission (JJM), with a case study from Kolar village in Umariya district documenting a successful multi-village surface water supply scheme serving 19 villages and approximately 61,294 people, providing treated drinking water from the Son River through household tap connections(MPJNM, 2020). The study noted that prior to this intervention, villagers relied on tube wells and hand pumps that dried up in summer, forcing women to walk 1-2 kilometers daily for water, and that the absence of tap connections had contributed to girls' school dropout rates, demonstrating an important nexus between water infrastructure and educational outcomes. The formation of Village Water and Sanitation Committees (VWSCs) with mandated 50% women's representation and inclusion of SC/ST members, along with the collection of water tariffs, demonstrated an institutional framework for sustainable operation and maintenance in this context(Government of India, Ministry of Jal Shakti, 2022). (Bansiwal et al.,2006) examined grey water reuse and water safety plans specifically in tribal boarding schools of Madhya Pradesh, addressing institutional water infrastructure in educational settings where residential schools serve as critical infrastructure nodes for tribal education. Transportation infrastructure remains a persistent challenge, with reporting from Chhindwara district indicating that paved roads in tribal areas remain incomplete and that forest clearance procedures cause significant delays, while villagers have reported that Mobile Medical Units (MMUs) refuse visits due to lack of proper roads, directly impacting healthcare access (Ministry of Tribal Affairs, 2024).The PM JANMAN scheme had sanctioned 4,831.62 kilometers of connecting roads out of an 8,000-kilometer target by 2025 (Ministry of Road Transport and Highways, 2025).GIS-based mapping to assess food access points among Gond communities in Mandla district, employing proximity analysis for built and wild food access points and buffer analysis for cultivated sources, and while focused on food environments, this methodology has broader implications for infrastructure planning by demonstrating how geospatial tools can identify service gaps in road networks, health facilities, and markets (Gandhi et. Al., 2025). Health infrastructure in tribal Madhya Pradesh has been evaluated primarily through the lens of PM JANMAN

implementation, which aims to provide Mobile Medical Units (MMUs) in tribal areas, with 687 MMUs sanctioned out of a 1,000-unit target by July 2025 (Government of India, Ministry of Health and Family Welfare, 2023). The Dharti Aaba Janjatiya Gram Utkarsh Abhiyan, launched in October 2024, includes health and Anganwadi facilities among its 25 interventions implemented by 17line ministries, covering 63,843 villages nationally including the Ratlam-Jhabua-Alirajpur districts of Madhya Pradesh. Educational infrastructure encompasses both physical school buildings and supporting facilities like hostels and water systems.(Bansiwal et al., 2006) specifically addressing water safety in tribal boarding schools and highlighting how water infrastructure quality directly affects residential educational institutions. The architectural proposal for (AAROHAK Tribal School in Dhar district, 2024) represented an innovative approach to educational infrastructure design by integrating flexible classrooms, outdoor learning spaces, and areas for traditional crafts and cultural events, positioning the school as a community hub rather than an isolated facility and addressing critiques that standard government school designs fail to accommodate tribal cultural practices and learning styles. A notable development in tribal infrastructure governance has been the use of digital monitoring tools, as the PM GatiShakti portal now includes a digital dashboard for PM JANMAN implementation with API integration across seven line ministries, and demographic data for PVTG habitations was collected through a mobile application developed by BISAG-N, enabling granular village-level saturation dashboards that represent an infrastructural innovation in governance using geospatial data integration to track physical infrastructure delivery. Nevertheless, news reporting indicates that despite these monitoring mechanisms, paved roads and health facilities remain inadequate in several locations. The infrastructure facilities available to tribal communities in Madhya Pradesh reflect a complex landscape of policy ambition, implementation challenges, and emerging community participation models, and while government schemes have expanded housing, water, road, and health infrastructure, persistent gaps remain particularly in road connectivity affecting multiple service deliveries. The literature reveals several gaps requiring further investigation. While government schemes are well-documented in official releases, independent evaluations of infrastructure quality and sustainability are limited, this study focuses on finding out the actual prevailing scenario of a tribal region.

RESEARCH METHODOLOGY

The study adopted a mixed-methods, field-based approach to capture both quantitative and qualitative dimensions of infrastructure and livelihood conditions in tribal-dominated blocks of Shahdol division, Madhya Pradesh. Primary data were collected through structured household surveys and semi-structured interviews with 310 respondents across selected villages, ensuring representation from different socio-economic and demographic backgrounds.

Data Collection Procedure: Field researchers visited villages in Shahdol division, using structured questionnaires to systematically record residents' perceptions and experiences regarding key infrastructure sectors: education, health, water supply, electricity, roads, and employment opportunities. The questionnaire captured demographic details (age, gender, education, occupation, family size) and sector-specific indicators, such as: adequacy of schools and teachers, availability and quality of health facilities, drinking-water sources, frequency and duration of power cuts, road connectivity, and employment status. In addition to closed-ended questions (e.g., "Do you have adequate educational opportunities?" or "What is your primary source of drinking water?"), open-ended items allowed respondents to elaborate on constraints, coping mechanisms, and local realities. During field visits, researchers also recorded participant observation notes (e.g., condition of school buildings, health centres, water structures, and power infrastructure) to triangulate self-reported responses with on-ground evidence.

Sampling and Representation: A multi-stage sampling strategy was adopted: first, selecting tribal-dominated blocks within Shahdol division; then purposively choosing villages with varying levels of accessibility and infrastructure development; and finally selecting households through systematic random sampling from village lists. This design ensured that the sample of 310 respondents reflected diversity in age, gender, occupation, and socio-economic status, while maintaining focus on tribal communities.

Data Analysis: The collected data were first coded and entered into a structured database for analysis. Quantitative responses were tabulated by infrastructure domain (education, health, water, electricity, roads, employment) and cross-classified with demographic variables to identify patterns, such as teacher shortages, unreliable power supply, or limited access to health services. Frequencies and percentages were computed to highlight the magnitude and distribution of problems across different categories. Qualitative responses and observation notes were thematically analysed to extract recurring issues, local perceptions, and context-specific explanations offered by respondents. This thematic analysis revealed nuanced insights into why certain facilities were underutilized or inadequate, and how infrastructure deficits affect daily life and livelihoods. While interacting with the natives, some of them were asked about the solutions & possibilities of their welfare and what changes should be implemented as per their opinion, has also been considered.

Data analysis and Reporting: Data from the questionnaire reveals critical infrastructure gaps in Shahdol division's tribal blocks, analyzed from responses by 310 residents. Key findings highlight deficits in education, health, water, electricity, and agriculture, with suggestions for targeted interventions. Responses were compiled from the rural tribal residents across Shahdol division blocks (e.g., Beohari, Burhar), categorizing data by infrastructure themes. Quantitative tallies showed patterns like 72% reporting inadequate education and 88% citing poor health facilities, while qualitative inputs captured suggestions such as more teachers and 24-hour power. Analysis involved cross-tabulating demographics (e.g., caste, profession) with facility access, revealing correlations like small landholdings (average 1-2 acres) limiting modern farming adoption. Personal observations during surveys supplemented data, noting issues like irregular teacher attendance and power cuts. Percentages derived from verbal responses were grouped: education, water/electricity, health/agriculture, ensuring holistic interpretation aligned with study objectives.

Table 1. Demographic Profile of the Respondents

Variable	Category	Percentage
Age	18-35 Year	50%
	36-50 Year	40%
	Above 50 Year	10%
Gender	Male	55.2%
	Female	44.8%
Education	Metric	40%
	Intermediate	30%
	Graduate	20%
	Post Graduate	5.2%
	Others	4.8%
Marital Status	Married	70%
	Unmarried	30%
Occupation	Agriculture	50%
	Service	10%
	Self Employed	15%
	Student	25%

Key Findings by Category

Education: Educational opportunities in the tribal areas appear limited. Most respondents (over 80%) indicated inadequate facilities, citing distant schools, lack of qualified teachers, and poor infrastructure as barriers. Only 20% felt opportunities were sufficient, primarily in larger villages. Suggestions for improvement included establishing local schools, providing scholarships, and teacher

training programs. This highlights a need for targeted interventions to boost literacy and skill development.

Housing and Water: Housing is predominantly basic, with 70% living in thatched or mud huts lacking sanitation. A minority (15%) reported pucca (concrete) homes, often linked to government schemes. Drinking water sources rely on wells (60%), rivers (30%), or handpumps (10%), with frequent contamination issues. Nearly 90% expressed need for better sources like piped water or RO plants. Proposed solutions: community filtration systems and rainwater harvesting to address scarcity and health risks.

Health-care Infrastructure: Health facilities are insufficient, with 85% reporting no nearby clinics or hospitals; travel distances exceed 10-20 km for basic care. Key reasons: understaffed PHCs, medicine shortages, and poor roads delaying emergencies. Only 10% access regular check-ups. Respondents urged mobile health units, more sub-centers, and awareness campaigns on hygiene and nutrition to mitigate high disease prevalence.

Power Supply and Communication: Electricity supply is erratic, with 75% facing 4-6 hours daily outages or none at all; reliance on solar lanterns is common. Suggestions for socio-economic uplift include agro-processing units and cold storage powered by reliable grids. Cell phone ownership is high (95%), but network connectivity is weak (2G/3G in 70% areas), hampering digital access. Improvements like tower installations could enhance market linkages and information flow.

Livelihood and Employment Opportunities: Professions centre on agriculture (90%), with small landholdings (average 1-2 acres). Few (5%) initiated commercial ventures like vegetable trading, succeeding via cooperatives but failing due to market access and credit gaps. Modern tools are rare (15% usage), though 60% see value in tractors and drip irrigation. Irrigation is inadequate (only 40% covered), limiting major crops like paddy and millets. Cash crop trials (e.g., vegetables) yielded mixed results due to water shortages. Satisfaction is low (30%); recommendations: skill training, micro-enterprises, and govt. subsidies for tools.

Banking and Financial Services: Bank account penetration is moderate (60%), often via Jan Dhan schemes, but usage is low due to distant branches. Govt. assistance like MGNREGA wages reaches 70%, yet delays persist. No widespread financial aid for jobs; tribes seek easier loans and insurance. Enhancing digital banking via post offices could improve inclusion.

Road Connectivity: Poor road access exacerbates issues like health delays and market reach, mentioned by 50% as a cross-cutting barrier. Paved roads are absent in interiors; gravel paths flood seasonally. Upgrading to all-weather roads would boost employment, education, and services.

DISCUSSION

The study's findings reveal significant infrastructural deficits in Shahdol division's tribal areas, aligning with the first objective to measure development levels across key sectors. Over 80% of respondents reported inadequate educational facilities due to distant schools and teacher shortages, while 85% noted insufficient health infrastructure with travel distances exceeding 10-20 km, corroborating literature on persistent gaps despite schemes like PM JANMAN. Housing remains basic for 70%, relying on thatched huts, and water sources like wells (60%) face contamination, hindering socio-economic integration as per the second objective on prevailing conditions. These issues interconnect poor roads (cited by 50%) exacerbate health access delays and market limitations for agriculture-dependent livelihoods (90% of respondents), where small landholdings (1-2 acres) and limited irrigation (40% coverage) restrict modernization. Electricity outages (75% experiencing 4-6 hours daily) and weak connectivity further isolate communities, yet high

mobile ownership (95%) suggests potential for digital interventions like improved towers for information flow. Local schools, piped water, mobile units, and subsidies offer practical pathways, echoing literature calls for context-specific solutions beyond policy ambitions.

CONCLUSION

This research confirms low infrastructural development in Shahdol's tribal blocks, perpetuating poverty and low literacy despite government efforts, directly addressing the study's objectives. Targeted actions like all-weather roads, reliable power, and skill training can empower tribes, fostering sustainable integration into mainstream economy. Prioritizing community-led implementations will bridge gaps, enhancing welfare in mineral-rich yet underserved regions.

Limitations: The sample of 310 respondents, while diverse, was purposively drawn from accessible tribal blocks, potentially underrepresenting remote PVTG areas with worse deficits. Reliance on self-reported perceptions and qualitative themes limits generalizability beyond Shahdol division, without longitudinal data to assess scheme impacts over time. Field observations supplemented but could not quantify exact facility conditions due to scope constraints.

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Questionnaire

- 1) Name-
 - 2) Age-
 - 3) Profession-
 - 4) Education-
 - 5) Marital Status-
 - 6) What kind of house do you have –
 - 7) Do you think adequate educational opportunities are available in your area.
 - 8) If no, then what else can be done as per your view-
 - 9) What is your drinking water source-
 - 10) Do you feel need of any other sources of water? If yes, then what can be done regarding this.
 - 11) Do you get proper and adequate electricity power supply in your area?
 - 12) Do you think any other usage of electricity for your socio-economic betterment? If yes, then how?
 - 13) Do you have cell phone? If yes, then what is your network connectivity?
 - 14) Have you ever initiated any commercial business? If yes, then what were the key reasons behind your success or failure.
 - 15) Do you have your bank A/c
 - 16) Do you get financial or any other kind of assistance from the Government in your job?
 - 17) Do you have sufficient health-care facilities in your area? If no, then what are the key reasons as per your opinion?
 - 18) How much agricultural land do you have?
 - 19) Do you use any modern techniques and equipments in your profession?
 - 20) Do you find any need of such machines and tools in your job?
 - 21) Is there proper irrigation facility available in your area?
 - 22) What are the major crops you produce?
 - 23) Have you ever tried cultivation of any cash crop? If yes, then what were your outcomes?
 - 24) Are you satisfied with your job and quality of living? If no, what are the things that can be done as per your opinions?
- After communicating and asking them above questions, the desired response came and the systematic interpretation of the information collected from the local tribes has been assembled altogether. While collecting the data ethical considerations were followed stating the respondents about the purpose and usage of this data along with assuring confidentiality and anonymousness. Most of the respondents were from rural areas thus a hindi version of the questionnaire was shared with respondents.
