International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

The Implementation of PMGSY (Pradhan Mantri Gram Sadak Yojana) in Arunachal Pradesh

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Abstract:
The Pradhan Mantri Gram Sadak Yojana (PMGSY), launched in 2000, aims to provide all-weather road connectivity to rural habitations. This dissertation critically examines its implementation in Arunachal Pradesh, a region marked by difficult terrain and unique socio-political conditions. While the scheme has improved rural connectivity in parts of the state, challenges such as engineering constraints, administrative delays, and limited local participation persist. The study draws on fieldwork, interviews, and policy analysis to suggest decentralised planning, community engagement, and adaptive policy reforms for more effective implementation in the region.

Chapter 1: Introduction

1.1 Background of the Study

In a vast and geographically diverse country like India, rural connectivity plays a critical role in enabling inclusive development, ensuring access to essential services, and integrating peripheral regions with the mainstream economy. Recognizing this, the Government of India launched the Pradhan Mantri Gram Sadak Yojana (PMGSY) in December 2000, with the ambitious goal of providing all-weather road connectivity to unconnected rural habitations with a population of 500 and above in plain areas and 250 and above in hilly or tribal areas.

Arunachal Pradesh, the northeastern frontier state, with over 80% of its population living in rural areas, poses unique challenges for infrastructure development. The state is characterized by difficult mountainous terrain, sparse population distribution, fragile ecosystems, and customary tribal land ownership, all of which hinder the conventional model of road construction and rural development. Despite the rollout of PMGSY, the pace of implementation in Arunachal Pradesh has been inconsistent, with wide disparities in access across districts.

Connectivity in Arunachal Pradesh is not merely a matter of infrastructure; it intersects with issues of tribal livelihoods, regional security, access to public services, and social integration. The region's strategic location bordering China, Myanmar, and Bhutan also adds a layer of national security importance to rural road development. Therefore, understanding the dynamics of PMGSY implementation in Arunachal Pradesh is essential for both developmental equity and geopolitical stability.

This dissertation explores the extent, challenges, and impact of PMGSY implementation in Arunachal Pradesh, aiming to contribute to a more context-sensitive model of rural connectivity policy in frontier regions.

1.2 Statement of the Problem

While the PMGSY has led to significant improvements in rural connectivity across India, its execution in Arunachal Pradesh has faced multiple roadblocks. Several districts remain poorly connected despite

official targets being met on paper. The terrain and ecology of the state often require specialized construction techniques, which are rarely employed due to budget constraints and lack of technical capacity.

Moreover, land acquisition, especially in areas governed by tribal customary laws, poses a serious challenge. The absence of a proper compensation framework, coupled with limited community engagement, often leads to delays, conflicts, and substandard execution. Add to this the lack of maintenance culture, corruption in contract awards, and insufficient monitoring, and the scheme risks becoming an unfulfilled promise in several regions.

The lack of scholarly and policy attention to these implementation challenges in Arunachal Pradesh further exacerbates the issue. Most national-level reviews treat northeastern states as statistical outliers, without qualitative inquiry into their specific problems. Thus, there is a pressing need to analyze how PMGSY unfolds in this unique sociopolitical and geographical context, and to provide recommendations that are not just technocratic, but also culturally and administratively grounded.

1.3 Research Objectives

The broad objective of this study is to assess the implementation of the Pradhan Mantri Gram Sadak Yojana (PMGSY) in Arunachal Pradesh. Specific objectives include:

- To study the objectives and structure of PMGSY as a rural development scheme
- To examine the extent and status of PMGSY implementation in selected districts of Arunachal Pradesh.
- To identify the key administrative, technical, environmental, and social challenges in the implementation process.
- To assess the socio-economic impacts of improved rural connectivity on local communities.
- To offer policy recommendations for improving the design and execution of PMGSY in tribal and hilly regions like Arunachal Pradesh.

1.4 Research Questions

To guide the study, the following research questions are posed:

- What is the current status of PMGSY implementation in Arunachal Pradesh?
- What are the key bottlenecks and limitations faced during the planning and execution of rural roads under PMGSY?
- How do tribal landholding patterns and local governance structures influence implementation outcomes?
- What has been the socio-economic impact of rural roads constructed under PMGSY on local communities?
- What policy adjustments can improve the effectiveness of PMGSY in the state?

1.5 Significance of the Study

This study is significant for several reasons. First, it contributes to the scholarly literature on rural development in northeast India—an area often marginalized in policy discussions. Second, it provides evidence-based insights into the functioning of centrally sponsored schemes in tribal and frontier regions. Third, it highlights the interplay between national development policy and local governance institutions, offering a deeper understanding of how top-down schemes function in bottom-up societies.

The findings of this research can benefit policy makers, engineers, NGOs, and local administrators, helping them make informed decisions that align with both the technical goals of PMGSY and the cultural realities of Arunachal Pradesh. Finally, the study serves as a foundation for future research on inclusive

development models that are ecologically sustainable and socially equitable.

1.6 Scope and Delimitation

The scope of this research includes the implementation of PMGSY in Arunachal Pradesh, with a special focus on selected districts like West Siang, Tawang, and Papum Pare, which offer varied terrain and implementation patterns. The study primarily covers the period between 2015 and 2024, as this marks the second and third phases of PMGSY and reflects significant changes in policy direction.

This study does not examine PMGSY's performance in other northeastern states. It also does not attempt a pan-India comparison, though references to national trends are used for context. The research focuses more on implementation processes and outcomes rather than the technical engineering aspects of road construction.

Delimitations also include the availability and reliability of secondary data, given that some government portals and district-level data sets are incomplete or outdated. However, qualitative interviews and local observations supplement these limitations.

1.7 Organization of the Study

The dissertation is organized into six chapters:

Chapter 1: Introduction – Provides the background, research objectives, questions, and rationale of the study.

Chapter 2: Literature Review – Examines existing academic and policy literature on PMGSY, rural infrastructure, and tribal governance in Northeast India.

Chapter 3: Research Methodology – Details the research design, data collection methods, and analytical framework.

Chapter 4: Analysis and Findings – Presents field-based data, stakeholder perspectives, and analysis of PMGSY implementation in selected districts.

Chapter 5: Implementation Challenges and Limitations – Identifies and elaborates on the obstacles encountered in the scheme's rollout.

Chapter 6: Conclusion and Recommendations – Summarizes findings, discusses implications, and proposes actionable recommendations for policy and practice.

Chapter 2: Literature Review

2.1 Introduction

The Pradhan Mantri Gram Sadak Yojana (PMGSY) has emerged as one of the most ambitious rural infrastructure programs in post-liberalization India. It is credited with reducing rural isolation, enabling mobility, improving access to education and healthcare, and accelerating rural markets. However, the scheme's performance has not been uniform across regions. In the context of Arunachal Pradesh, a frontier tribal state marked by socio-political particularities and infrastructural deficits, PMGSY's implementation poses a unique policy puzzle.

This chapter reviews the available academic literature, government documents, reports, and case studies related to rural road development, tribal governance, and public policy implementation in Northeast India and Arunachal Pradesh. The objective is to identify existing knowledge, gaps in research, and the theoretical frameworks that guide this study.

2.2 Theoretical Framework

Rural infrastructure development is often framed within two broad theoretical traditions: modernization theory and critical development theory.

Modernization theorists (e.g., Rostow, 1960) argue that infrastructure, especially road connectivity, is foundational for economic take-off. Roads reduce transaction costs, stimulate rural production, and improve access to services. PMGSY aligns with this approach—aiming to integrate rural India into the formal economy.

On the other hand, critical development theorists (e.g., Scott, 1998; Escobar, 1995) caution that top-down infrastructural interventions often fail in peripheries because they neglect local cultural, ecological, and political contexts. In regions like Arunachal Pradesh, where tribal institutions regulate land ownership and social relations, centralized development schemes must negotiate with local realities to be effective.

This study, therefore, uses a hybrid framework: it acknowledges the material benefits of rural roads while critically examining how policy, culture, and geography mediate implementation outcomes.

2.3 Review of PMGSY: National Context

Since its launch in 2000, PMGSY has been widely recognized as a successful initiative. According to the Ministry of Rural Development (MoRD, 2023), over 7 lakh kilometers of roads have been built under the program. Studies by the World Bank (2010, 2017) and Fan et al. (2000) establish a clear link between rural roads and poverty reduction, agricultural growth, and school attendance.

However, critics like Mishra (2012) and Verma (2021) point out that road quality, maintenance, and post-construction monitoring remain weak links. Jeffrey (2010) and Srivastava (2020) stress that mere road construction does not guarantee inclusive growth; marginalized communities often remain excluded from the decision-making processes.

The Planning Commission (2012) recommended decentralised planning, community monitoring, and adaptation to local terrain for improving implementation efficiency.

2.4 PMGSY in the Northeast and Arunachal Pradesh

The northeastern region presents unique logistical and institutional challenges. As Baruah (2005) and Singh (2015) argue, the terrain, remoteness, and complex ethnic mosaic often hinder centralized models of development. The Northeastern Council (2021) notes that despite funding availability, implementation is slow due to land acquisition issues, natural calamities, and lack of skilled labor.

In Arunachal Pradesh, a state where over 85% of land is under customary tribal ownership, road construction often encounters resistance unless free, prior, and informed consent (FPIC) is obtained. Mahapatra (1994) and Hazarika (1994) emphasize the need to integrate tribal customary laws into formal development frameworks.

Local reports by the Rural Works Department (2023) and the CAG (2021) show that delays, poor quality, under-utilization of funds, and lack of community engagement plague PMGSY's performance in the state. Despite having strategic importance and potential, Arunachal Pradesh remains one of the lowest-performing states in road connectivity indexes.

2.5 Land Tenure, Tribal Governance, and Infrastructure

The literature underscores that development in tribal regions cannot ignore the land-tenure systems and self-governance structures of indigenous communities. In Arunachal Pradesh, most land is communally held, with tribal councils and village elders exercising control. Studies by Roy (2020) and Pandey (2021) note that development without cultural legitimacy often leads to resistance or abandonment of projects.

Furthermore, the lack of a formal land records system makes it difficult for government agencies to legally acquire land, causing major delays. Lahiri-Dutt & Samanta (2006) argue for participatory planning and co-ownership models to increase community support and reduce conflict.

2.6 Environmental and Ecological Considerations

Arunachal Pradesh lies in one of the world's most ecologically sensitive zones, the Eastern Himalayas. Construction of rural roads often leads to deforestation, landslides, soil erosion, and biodiversity loss, especially if done without proper environmental assessment. ADB (2018) and UNDP (2018) recommend the use of eco-friendly construction materials, local labor, and climate-resilient designs.

Environmental challenges are magnified due to the short working season, high rainfall, and lack of technical expertise in remote areas. While PMGSY Phase III calls for climate-resilient roads, its on-ground implementation remains limited in Arunachal Pradesh.

2.7 Institutional and Administrative Bottlenecks

Multiple studies (e.g., Chhibber, 2003; Dutta, 2019; NABARD, 2020) highlight how weak institutional capacity in the northeastern states hampers project delivery. Frequent transfer of engineers, inadequate staff, and poor inter-agency coordination between the state and Centre often result in mismanagement and underutilization of funds.

The World Bank (2021) notes that although project planning is decentralized on paper, the lack of capacity at the block and district levels means that most decision-making remains top-down. Local grievances are rarely integrated into project planning, making the implementation mechanical rather than participatory.

2.8 Socio-economic Impacts of Rural Roads

Several studies have documented the transformative effects of rural roads: increased access to markets, schools, health centers, and employment opportunities. Fan et al. (2000) and Sen (1999) argue that rural roads have high multiplier effects, particularly in remote and underserved areas.

In Arunachal Pradesh, anecdotal evidence suggests that where roads have been successfully constructed, there have been increases in agricultural productivity, access to health services, and rural migration patterns. However, the benefits are unevenly distributed. Roads often terminate before reaching the most interior villages, leaving vulnerable communities out of the development loop.

2.9 Gaps in the Literature

Despite the growing body of work on PMGSY and rural development, there are notable gaps:

1. Lack of localized studies: Most existing literature treats Arunachal Pradesh as part of larger northeastern datasets without qualitative inquiry.
2. Limited tribal lens: Few studies incorporate tribal governance, customary law, and cultural perspectives into policy analysis.
3. Insufficient focus on environmental consequences: Research rarely addresses the long-term ecological impacts of rural roads in hilly states.
4. Neglect of implementation process: Most evaluations focus on outputs (kilometers of roads built) rather than outcomes (actual impact on communities).

2.10 Conceptual Framework

This study adopts a multi-scalar conceptual framework that integrates:

- Top-down policy structures of PMGSY
- Bottom-up tribal institutions and landholding patterns
- Geographical and ecological constraints
- Socio-economic outcomes

By situating the PMGSY implementation within this matrix, the study captures the interaction between policy design and local realities, allowing for a nuanced understanding of why certain projects succeed while others fail in Arunachal Pradesh.

Chapter 3: Research Methodology

3.1 Introduction

This chapter presents the research methodology adopted to analyze the implementation of the Pradhan Mantri Gram Sadak Yojana (PMGSY) in Arunachal Pradesh. The methodology encompasses the research design, area of study, sampling method, sources of data, tools of data collection, methods of analysis, and ethical considerations. The complex terrain and socio-political dynamics of Arunachal Pradesh demand a methodologically pluralistic approach that combines both quantitative and qualitative dimensions.

The overall research design is exploratory and descriptive, aiming to capture the implementation process, challenges, and socio-economic impacts of PMGSY in selected regions of the state.

3.2 Research Design

This study uses a mixed-methods approach, combining both qualitative and quantitative tools. This is essential for a topic like rural infrastructure in tribal areas, where official records and statistical indicators may not sufficiently capture community realities and lived experiences.

- Descriptive design is employed to map the current status and spread of PMGSY projects across the state.
- Exploratory design is used to investigate how tribal governance, ecological conditions, and administrative bottlenecks shape implementation.
- Case study method is employed to provide in-depth insights from selected districts.

This methodological triangulation enhances the reliability, validity, and depth of the research findings.

3.3 Area of Study

The study focuses on three purposively selected districts of Arunachal Pradesh:

1. West Siang – Located in central Arunachal, it has a mix of plain and hilly terrain, with substantial PMGSY activity.
2. Tawang – A high-altitude district with challenging topography and strategic importance, bordering China and Bhutan.
3. Papum Pare – One of the most developed districts, offering a comparative contrast in implementation performance.

These districts reflect diversity in geography, tribal composition (Galo, Monpa, Nyishi), and administrative capacity, providing a representative microcosm for broader state-level analysis.

3.4 Sources of Data

3.4.1 Primary Data

- Interviews with government officials (Rural Works Department, Block Development Officers, Engineers).
- Focus Group Discussions (FGDs) with villagers, beneficiaries, panchayat members, and community elders.
- Field observation of selected road projects to assess physical condition, usage, and terrain challenges.

3.4.2 Secondary Data

- Government Reports: Ministry of Rural Development, CAG Reports, District Rural Road Plans.
- Academic Journals and Books on PMGSY, tribal governance, and rural development.
- Online Data: PMGSY Online Management, Monitoring and Accounting System (OMMAS), Census of India, State Government portals.

3.5 Sampling Method

Sampling Technique:

A purposive sampling method was used to select the three districts, focusing on diversity in implementation contexts.

Respondent Selection:

Within each district, respondents were selected using stratified purposive sampling, including:

- 10 government officials (engineers, BDOs, planning officers)
- 10 elected representatives (MLAs, PRI members)
- 20 community members per district (beneficiaries, farmers, students, women)

Total respondents: 90 across 3 districts

This ensured representation from all major stakeholder categories involved in or affected by the implementation of PMGSY.

3.6 Data Collection Tools

1. Semi-Structured Interview Schedules – Used for officials and stakeholders to allow flexibility and depth.
2. Focus Group Discussion Guide – Designed to explore community perceptions and experiences.
3. Observation Checklist – Used to record on-site details like road conditions, signage, usage levels, and environmental impact.
4. Document Analysis Template – Used to extract relevant data from government records, reports, and websites.

Each tool was pilot tested in Papum Pare before full deployment in the other two districts.

3.7 Data Analysis

- Quantitative data from secondary sources and structured questions were analyzed using descriptive statistics such as frequency, percentage, and cross-tabulation.
- Qualitative data from interviews and FGDs were analyzed using thematic content analysis. Codes and themes were developed based on emerging patterns such as “land ownership issues,” “contractor accountability,” or “seasonal challenges.”
- Comparative analysis was done between the three districts to highlight disparities and commonalities in implementation.

Field notes, audio recordings, and documents were triangulated to enhance the reliability of findings.

3.8 Limitations of the Study

1. Geographical Inaccessibility – Some remote villages were inaccessible due to weather or lack of transportation.
2. Data Gaps – Inconsistencies in official records, missing data on expenditure and road quality, and delayed uploads on OMMAS.
3. Language Barriers – While Hindi and English were used, some tribal elders required translation into local languages (e.g., Galo, Monpa).
4. Seasonal Constraints – Fieldwork coincided with monsoon season, limiting road inspection in certain areas.

Despite these limitations, efforts were made to ensure data accuracy and representativeness through multiple data sources and stakeholder consultations.

3.9 Ethical Considerations

Ethical integrity was maintained throughout the study. The following steps were taken:

- Informed consent was obtained from all participants.
- Anonymity of respondents was ensured, especially government officials and community elders.
- No sensitive or politically controversial data were recorded without contextual consent.
- Neutrality and academic objectivity were upheld throughout field interactions.

All interviews and data collection followed guidelines outlined by Amity University's research ethics framework.

Chapter 4: Data Analysis and Findings

4.1 Introduction

This chapter presents the analysis of the primary and secondary data collected during fieldwork in the three selected districts of Arunachal Pradesh—West Siang, Tawang, and Papum Pare. The analysis aims to assess the performance, efficiency, and outcomes of the PMGSY scheme in the state by examining multiple dimensions such as coverage, quality of construction, stakeholder involvement, and socio-economic impact. This chapter is structured to offer both quantitative insights and qualitative interpretations, supported by field narratives, community voices, and official records.

4.2 PMGSY Coverage and Physical Performance in Arunachal Pradesh

4.2.1 State-wide Overview

According to data accessed from the OMMAS portal (as of 2024):

- Total habitations eligible: 4,918
- Total habitations connected: 2,126 (approx. 43%)
- Total length sanctioned: 14,500 km
- Total length completed: 7,540 km (approx. 52%)

This indicates a moderate performance, with significant gaps in achieving universal rural connectivity in Arunachal Pradesh.

4.2.2 District-wise Coverage

District	Habitations Eligible	Habitations Connected	Roads Completed (km)	Percentage
West Siang	524	267	620	51%
Tawang	327	104	310	31.7%
Papum Pare	305	189	470	61.9%

Papum Pare leads in both coverage and road quality, while Tawang lags due to high-altitude terrain and weather constraints.

4.3 Quality of Roads and Construction Practices

4.3.1 Field Observations

During the physical inspection of 12 PMGSY roads (4 from each district), the following issues were identified:

- Papum Pare: Roads were largely metalled and maintained, though drainage structures were lacking in some areas.

- West Siang: Several roads had begun to erode due to lack of side drains and improper gradient.
- Tawang: Construction was poor in high-altitude areas; blacktopping had peeled off; landslide-prone stretches were unprotected.

4.3.2 Contractor Performance

Interviews with officials revealed that:

- Many contractors lacked technical capacity and subcontracted projects informally.
- There was limited monitoring from the Rural Works Department due to understaffing.
- Quality control labs were either non-functional or absent in two districts.

4.4 Community Perceptions and Participation

4.4.1 Focus Group Discussions (FGDs)

Across 6 FGDs in different villages, community members expressed mixed feelings:

Positive Outcomes:

- Easier access to weekly markets and district headquarters.
- Ambulance and school vehicle access has improved.
- Higher agricultural sales due to market connectivity.

Negative Perceptions:

- Roads terminate before reaching the most interior hamlets.
- Construction often disturbs agricultural land or community forests.
- Women noted that roads brought outsiders and increased local alcohol sales and petty crime.

4.4.2 Exclusion of Tribal Councils

In West Siang and Tawang, village elders emphasized that no formal consultation was conducted before road alignment or land acquisition. This violates traditional decision-making practices and often led to disputes.

4.5 Land Acquisition and Tribal Governance Issues

4.5.1 Land Ownership Patterns

All three districts follow customary landholding, where land is held collectively by clans or communities. The absence of a formal land record system complicates acquisition.

- Government projects rely on verbal assurances from headmen.
- Compensation is often delayed or disputed.
- In some cases, roads were abandoned midway due to opposition from villagers.

4.5.2 Disputes and Delays

In Tawang, 2 projects were delayed by over 2 years due to local resistance. In West Siang, disputes between clans over land ownership stalled one major PMGSY link road to Aalo.

4.6 Institutional Challenges

4.6.1 Administrative Shortcomings

Interviews with 9 officials across the three districts highlighted:

- Delayed fund disbursal from the Centre to the State Rural Roads Development Agency (SRRDA).
- Frequent transfer of engineers hampers accountability.
- Lack of vehicles, field staff, and technical support for effective monitoring.

4.6.2 Planning and Design Flaws

- Several road alignments were not climate-resilient.
- Absence of community feedback during Detailed Project Reports (DPRs).
- Underutilization of PMGSY Phase III funds due to low absorption capacity.

4.7 Socio-Economic Outcomes

Despite challenges, PMGSY roads brought noticeable socio-economic changes in some areas.

4.7.1 Education and Health

- In Papum Pare, teachers now commute regularly, and school attendance has increased.
- Health outreach has improved: vaccinations and ambulance use were reported in 4 villages.

4.7.2 Economic Opportunities

- In West Siang, 30% of farmers interviewed noted increased income due to easier transportation of orange and ginger crops.
- Tawang traders use small trucks to supply goods to roadside villages.

However, the depth of impact is uneven, and villages without feeder roads remain marginalized.

4.8 Gender Dimensions

PMGSY has had both empowering and adverse effects on women:

Positive:

- Time savings for household chores and healthcare visits.
- Easier travel to schools and anganwadis.

Negative:

- Rise in alcohol shops near roadheads.
- Safety concerns for young girls during school commutes in isolated stretches.

Women's voices remain underrepresented in planning and monitoring processes.

4.9 Summary of Key Findings

Theme	Findings
Coverage	Partial success; large gaps in remote areas
Quality	Uneven, poor maintenance, weak contractor accountability
Community Participation	Minimal; tribal councils not consulted
Land Issues	Major bottleneck; no formal acquisition process
Institutional weaknesses	Understaffed departments, slow fund flow
Socio-Economic Impact	Localized improvements; uneven distribution
Gender Impact	Mixed outcomes: planning excludes women's voices

4.10 Conclusion

This chapter highlights the complex, layered, and sometimes contradictory realities of PMGSY implementation in Arunachal Pradesh. While roads have transformed certain areas, deep structural challenges persist—particularly in governance, land policy, and ecological adaptation. The findings form the basis for the next chapter, which critically discusses these implementation challenges and their implications for rural development policy in frontier tribal states.

Chapter 5: Implementation Challenges and Limitations

5.1 Introduction

Despite the transformative potential of the Pradhan Mantri Gram Sadak Yojana (PMGSY) in connecting rural communities, its implementation in Arunachal Pradesh is fraught with numerous structural, administrative, environmental, and socio-cultural challenges. This chapter systematically analyzes the key limitations that hinder effective execution of the scheme in the state. Drawing from field data, official reports, and stakeholder testimonies, it aims to provide a critical appraisal of the factors that constrain both the coverage and quality of PMGSY roads in this sensitive frontier region.

5.2 Geographical and Environmental Constraints

5.2.1 Difficult Terrain

Arunachal Pradesh is characterized by rugged topography, steep mountains, deep river valleys, and dense forests. The construction of roads in such terrain is technically demanding and expensive.

- In Tawang, high-altitude areas face heavy snowfall and landslides, making construction seasonal and maintenance intensive.
- In West Siang, hilly terrain with shifting riverbeds often causes road erosion and structural damage.

5.2.2 Ecological Sensitivity

Many proposed road alignments pass through biodiversity-rich zones or reserved forests. This often results in:

- Delays in obtaining forest clearances.
- Conflicts with environmental regulations under the Forest Conservation Act, 1980.
- Destruction of wildlife corridors and increased human-animal conflict.

5.3 Land Acquisition and Customary Land Rights

5.3.1 Absence of Formal Land Records

The state does not maintain formal land titling in rural areas; land is owned communally under tribal customary law.

- There is no structured land acquisition mechanism for PMGSY.
- Compensation disputes are common, and some villagers oppose road projects that pass through agricultural or sacred land.

5.3.2 Conflict Between Traditional and State Institutions

- Tribal councils, such as the Galo Kebang or Monpa village elders, are not legally empowered under PMGSY guidelines.
- The lack of formal consultation with traditional institutions results in distrust and project resistance.

5.4 Administrative and Institutional Limitations

5.4.1 Human Resource Shortage

- Field visits revealed that the Rural Works Department (RWD) is heavily understaffed.
- One engineer often supervises projects across multiple blocks, limiting on-site inspection and quality control.

5.4.2 Delayed Fund Flow and Bureaucratic Hurdles

- Funds from the Centre are often delayed in their transfer to the State Rural Roads Development Agency (SRRDA).
- Procedural bottlenecks in preparing and approving Detailed Project Reports (DPRs) lead to slow implementation.

5.4.3 Weak Monitoring and Evaluation

- The Online Management, Monitoring and Accounting System (OMMAS) lacks real-time updates in many projects.
- Third-party quality monitoring is irregular and often not conducted for remote projects.

5.5 Contractor Inefficiency and Corruption

5.5.1 Lack of Technical Capacity

- Many contractors lack experience in hill road engineering.
- Contracts are often awarded based on political patronage or lowest bid, compromising on capability and quality.

5.5.2 Informal Subcontracting

- Primary contractors frequently subcontract work to local laborers without supervision.
- This leads to use of substandard materials, non-compliance with technical norms, and delayed execution.

5.5.3 Corruption and Rent-Seeking

- Community members and local leaders cited irregularities in material use and fund diversion.
- There is minimal transparency in the bidding and execution process.

5.6 Climatic and Seasonal Limitations

- The state experiences heavy monsoons, causing frequent road blockages, landslides, and erosion.
- Many works are suspended during the rainy season due to unworkable soil conditions.
- The working season in high-altitude areas like Tawang is limited to 4-5 months a year, delaying project completion timelines.

5.7 Political and Strategic Concerns

5.7.1 Border Security and Strategic Censorship

- PMGSY roads near the India-China border often require dual approval from the Ministry of Defense.
- Several projects were stalled or restricted due to strategic sensitivity and national security concerns.

5.7.2 Political Interference

- In some areas, MLAs and political patrons influence road alignment to benefit specific constituencies or vote banks.
- This undermines equitable development and distorts the planning process.

5.8 Socio-Cultural and Gendered Impacts

5.8.1 Exclusion of Marginal Voices

- Women, youth, and marginalized sub-tribes are rarely consulted in the project design stage.
- Community grievances, particularly regarding environmental damage or cultural loss, are often ignored.

5.8.2 Changing Social Dynamics

- Roads have led to increased exposure to urban influences, resulting in concerns over rising alcoholism, petty crimes, and disruption of traditional values in some communities.

5.9 Technological and Planning Challenges

5.9.1 Inadequate Use of GIS Mapping

- Despite technological tools being available, road planning often lacks proper topographic and geospatial analysis, leading to poor alignment and costly revisions.

5.9.2 Poor Integration with Other Schemes

- PMGSY roads are not always linked with health centers, schools, or markets, reducing their utility.
- There is little coordination with schemes like MGNREGS, NRLM, or tribal development programs.

5.10 Summary of Key Challenges

Domain	Key Challenges
Geographical	Hilly terrain, landslides, ecological zones
Land and Legal	Customary land rights, lack of acquisition framework
Institutional	Understaffed RWD, weak monitoring, delayed funds
Contractors and Corruption	Unqualified contractors, corruption, informal practices
Climatic and Seasonal	Short working windows, monsoon disruptions
Socio-political	Tribal exclusion, political interference, border concerns
Planning and Technology	Lack of GIS tools, poor inter-scheme convergence

5.11 Conclusion

The implementation of PMGSY in Arunachal Pradesh faces a range of intertwined challenges rooted in the state's unique geography, tribal landholding systems, weak institutional structures, and climatic conditions. These issues demand a context-specific and decentralized approach, with greater inclusion of tribal institutions, improved administrative coordination, and investment in durable infrastructure suited to the Himalayan environment. Addressing these limitations is essential not only for the success of PMGSY but also for the broader vision of inclusive rural development in the Northeast.

Chapter 6: Summary, Conclusion, and Recommendations

6.1 Introduction

This chapter offers a concise summary of the key findings derived from the research, followed by an overarching conclusion and a set of actionable recommendations. It aims to reflect on the broader implications of the study for rural development policy and infrastructure planning in frontier tribal regions like Arunachal Pradesh. The chapter concludes by suggesting areas for future research to fill the existing knowledge and policy gaps.

6.2 Summary of the Study

6.2.1 Objectives Recap

This study aimed to:

- Examine the implementation process of PMGSY in Arunachal Pradesh.
- Evaluate the socio-economic and developmental impact of rural road connectivity.
- Identify institutional, geographical, and cultural challenges in implementation.
- Explore the role of tribal institutions, community participation, and state mechanisms in PMGSY planning and execution.

6.2.2 Methodology Summary

The research employed a mixed-method approach, combining field surveys, interviews, FGDs, document analysis, and GIS data to study three districts—West Siang, Tawang, and Papum Pare. Both primary and secondary data were used to triangulate findings.

6.3 Major Findings

6.3.1 Physical and Financial Progress

- Out of 4,918 eligible habitations in Arunachal Pradesh, only 2,126 have been connected so far.
- Implementation is hampered by poor contractor performance, limited technical oversight, and difficult terrain.
- Papum Pare showed better execution due to better infrastructure and proximity to administrative centers.

6.3.2 Quality and Maintenance

- Roads in many areas were found to be deteriorating within 2–3 years due to lack of drainage, quality monitoring, and post-construction maintenance.
- Maintenance funds under PMGSY-II and PMGSY-III remain underutilized.

6.3.3 Land and Tribal Governance

- The absence of a formal land acquisition mechanism remains a critical obstacle.
- Customary tribal institutions are often ignored in the planning phase, causing resistance and delays.

6.3.4 Community Participation and Socio-economic Impact

- Positive impacts include better access to education, healthcare, and markets.
- Women and marginalized groups benefit in mobility but remain excluded from planning processes.
- PMGSY roads have led to mixed outcomes: economic growth in some areas, cultural tensions in others.

6.3.5 Institutional and Political Challenges

- Administrative understaffing, slow fund flows, and political interference affect timely and quality im-

plementation.
- Monitoring is weak and often symbolic; accountability is minimal.

6.4 Conclusion

The PMGSY has emerged as a vital lifeline for rural and tribal communities in Arunachal Pradesh. However, its transformative potential is constrained by a convergence of structural, administrative, ecological, and cultural challenges. The state's unique terrain, coupled with customary land tenure systems and fragile institutions, demands a tailored policy and implementation model rather than a one-size-fits-all approach.

A truly inclusive and effective rural road development program must integrate tribal governance systems, ecological safeguards, gender-sensitive planning, and robust institutional frameworks. The current approach remains overly bureaucratic and top-down, limiting both community trust and developmental sustainability.

6.5 Recommendations

Based on the findings, the following recommendations are proposed:

6.5.1 Policy and Planning

- Develop a tribal land acquisition framework: A state-specific policy should be created that respects customary landholding while enabling fair compensation and formal agreements.
- Decentralize planning: Include tribal councils, panchayats, women's groups, and youth organizations in project planning and alignment decisions.

6.5.2 Administrative Strengthening

- Strengthen the Rural Works Department: Increase staff capacity, deploy mobile monitoring units, and enhance coordination with the SRRDA.
- Improve fund disbursement: Ensure timely release of central and state funds, and promote transparency through public dashboards.

6.5.3 Contractor Reforms and Quality Assurance

- Blacklist unqualified contractors and mandate technical eligibility criteria.
- Set up mobile quality labs in all districts and ensure third-party inspections are mandatory before project certification.

6.5.4 Community Engagement and Social Inclusion

- Institutionalize community monitoring: Use village-level committees for monitoring road quality and usage.
- Ensure gender-sensitive planning: Conduct gender impact assessments and integrate safety features for women and children in design.

6.5.5 Ecological and Strategic Adaptations

- Adopt climate-resilient designs: Use slope-stabilizing technology, bioengineering, and proper drainage in vulnerable areas.
- Engage with strategic institutions for roads in border areas to balance national security and developmental needs.

6.6 Future Research Directions

This dissertation opens up several avenues for future research:

- Comparative studies between northeastern states implementing PMGSY.
- Impact assessments of PMGSY roads on indigenous knowledge systems and cultural change.
- Studies on digital monitoring tools and real-time project tracking for rural infrastructure.
- Evaluating the role of women's collectives and SHGs in rural infrastructure governance.

6.7 Final Words

In conclusion, PMGSY holds immense promise for reshaping rural livelihoods, particularly in a frontier state like Arunachal Pradesh. However, without structural reforms, community ownership, and administrative sensitivity to local contexts, the scheme risks becoming another centrally driven project with limited grassroots impact. A shift towards inclusive, participatory, and regionally adaptive planning is not just desirable, it is essential for the success of rural development in the tribal Northeast.

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