ASIAN INFRASTRUCTURE INVESTMENT BANK

PROJECT LEARNING REVIEW REPORT

December 2024

Gujarat Rural Roads Project

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ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
CEIU	Complaints-resolution, Evaluation, and Integrity Unit
CSO	Civil Society Organization
EIRR	Economic Internal Rate of Return
ELA	Early Learning Assessment
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
ESS	Environmental and Social Standards
GRRP	Gujarat Rural Roads Program
INR	Indian Rupee
IFI	International Financial Institution
MD-CEIU	Managing Director of the Complaints-resolution, Evaluation, and Integrity Unit
MMGSY	Chief Minister's Rural Roads Program (Mukhya Mantri Gram Sadak Yojana)
NPR	Non-Plan Road
PCN	Project Completion Note
PIMR	Project Implementation Monitoring Report
PLR	Project Learning Review
PLT	Project Team Leader
PMC	Project Management Consultant
PMGSY	Prime Minister's Rural Roads Program
PR	Plan Road
PTL	Project Team Leader
R&BD	Roads and Buildings Department of Gujarat
RMF	Results Monitoring Framework
RPMS	Road Progress Monitoring System
TA	Technical Assistance
TPPF	Tribal Population Planning Framework

ACKNOWLEDGEMENT

This Project Learning Review (PLR) was prepared by a team of staff and consultants from the Learning and Evaluation function of the Complaints-Resolution, Evaluation and Integrity Unit (CEIU) at the Asian Infrastructure Investment Bank (AIIB).

Led by Eskender Zeleke, Head of AIIB's Independent and Learning Evaluation Function, the core team comprised Charles Melhuish (Transport Expert), Marla Hinkenhuis (CEIU Analyst), and national experts Jay Soni, Payal Mulchandani and Sharon Weir. Their combined expertise and insights were instrumental in the successful completion of this report. The team was supported by CEIU Executive Assistant Yuan Chang and CEIU Administrative Assistant Yifan Hua.

The PLR further benefited from the valuable contributions of Asita De Silva as an external editor, while Toshiyuki Yokota, Principal Evaluation Specialist at the Asian Development Bank, provided critical guidance as an external peer reviewer, ensuring the rigor and quality of the review process.

This PLR was prepared under the strategic direction of Marvin Taylor-Dormond, Managing Director of CEIU (MD-CEIU). The team is also grateful for the unwavering support of AIIB staff, the Government of Gujarat, and the numerous stakeholders and beneficiaries whose cooperation during the on-site visits greatly enriched the review's findings and outcomes.

KEY DATA: GUJARAT RURAL ROADS PROJECT (GRRP)

Project ID:	0025-IND	**Investment Number:**	L0025A
Member:	India	**Region:**	Southern Asia
Sector:	Transport	**Sub-sector:**	Rural Road
Financing Type:	Loan	**Co-financier(s):**	none
Environmental and Social (E&S) category:	B	**Project Risk:**	Medium
Borrower:	Republic of India	**Implementing Agency:**	Roads and Buildings Department of the Government of Gujarat
Project Team Leader(s) (PTL):	Roberto Salgado, Investment Operations Specialist Anzheng Wei (EX-PTL), Investment Officer Hari Bhaskar (EX-PTL), Senior Investment Operations Specialist		

PROJECT SUMMARY AND OBJECTIVE

Project objective:	The objective of the Project is to improve the road transport connectivity by providing all weather rural roads to about 4,000 villages in all the 33 districts of the state of Gujarat.
Component 1:	Construction and Upgradation of Non-Plan Roads
Component 2:	Upgradation of Plan Roads
Component 3:	Technical assistance
Component 4:	Application of innovative technologies

KEY PROJECT DATA	At appraisal	At completion
Total project cost:	USD658 million	USD402.37 million
AIIB loan:	USD329 million	USD329 million
Government:	USD329 million	USD73.37 million
Economic Internal Rate of Return (EIRR):	15.8%	Not estimated

KEY DATES

Appraisal mission:	May 3-6, 2017	**Loan negotiations:**	May 23-27, 2017
Approval:	July 4, 2017	**Signing:**	August 4, 2017
Effective:	October 26, 2017	**Restructured (if any):**	none
Original closing:	December 31, 2019	**Revised closing (if any):**	none
Amendment to the loan agreement:	December 02, 2019	**AIIB implementation monitoring missions:**	6 (2017-2020)

DISBURSEMENT DATA

Committed:	USD329 million	**Cancelled (if any):**	none
Disbursed:	USD329 million	**Undisbursed:**	none
First disbursement:	USD56.35 million March 14, 2018	**Last disbursement:**	USD123.03 million July 6, 2020
Disbursement ratio:	100%		

Executive Summary

PURPOSE AND PROCESS

This Project Learning Review (PLR) report presents the findings of an independent assessment of the Gujarat Rural Roads Project (GRRP) in India, supported by the Asian Infrastructure Investment Bank (AIIB). This PLR is based on evidence on the GRRP's preparation and implementation. The PLR team conducted comprehensive data collection, including a desk review of relevant documents, discussions with AIIB staff, and a visit to India for site visits to 13 villages and interviews with Project stakeholders in August 2024. The GRRP Project was developed and executed during the early phase of the Bank's establishment. The Complaints-resolution, Evaluation and Integrity Unit (CEIU) recognizes that processes and procedures have evolved since then.

PROJECT SUMMARY

The GRRP in India was AIIB's first stand-alone financing in the roads sector, making it a unique Project for AIIB. Approved in July 2017, AIIB provided a USD329 million loan to support the Government of Gujarat's Chief Minister's Rural Roads Program (Mukhya Mantri Gram Sadak Yojana, MMGSY). The Project aimed to improve rural road connectivity for approximately 4,000 villages across 33 districts, directly benefiting around eight million people by enhancing access to services and fostering economic growth.

PROJECT OBJECTIVES

The GRRP aimed to:

1. Provide all-weather road access to rural communities, improving connectivity for 4,000 villages.
2. Enhance rural transportation, enabling better movement of people and goods.
3. Improve access to essential services such as education, health care, and markets.
4. Promote economic growth and employment in rural areas, contributing to poverty reduction.

OVERALL PROJECT ASSESSMENT

The Project is rated **Successful**. The GRRP was **Relevant**, addressing critical rural connectivity needs in Gujarat while aligning with both national and state priorities and AIIB's strategic focus on infrastructure development. The Project was **Effective**, exceeding its targets for village connectivity and benefiting approximately eight million people. Although the ability to capture broader outcomes was limited by the

absence of a robust Results Monitoring Framework (RMF), CEIU's visits to 13 villages confirmed socioeconomic benefits, such as improved access to markets, healthcare, education, and enhanced agricultural productivity, for the visited villages. The Project demonstrated **Efficiency** through adequate economic returns, cost savings, and timely implementation. The **Likely Sustainability** of its outcomes is supported by the institutional and financial capacity of the Roads and Buildings Department (R&BD) to maintain the road network. **AIIB's Work Quality** was rated **Satisfactory**, reflecting its responsive and flexible approach, although challenges related to staff turnover and monitoring were noted. The **Client's Work Quality** was rated **Highly Satisfactory**, with R&BD showing exceptional project management and effective handling of environmental and social risks. In conclusion, the GRRP is overall rated **Successful**.

RELEVANCE

The Project is rated **Relevant**. It was aligned with the priority needs of the state of Gujarat and the national objective of improving physical connectivity in disadvantaged rural areas. The Project was designed to support increased economic and social activities in rural communities and provide greater opportunities for residents to participate in economic growth. It was consistent with AIIB's mission of providing "infrastructure for tomorrow" and held significance for the institutional development of AIIB as its first stand-alone road project. The distribution of works under the Project was well-aligned with development needs across the state, and the design appropriately addressed the rural population's transport requirements. However, the Project experienced some design weaknesses, and the RMF was not robust enough to adequately capture the anticipated outcomes.

EFFECTIVENESS

The Project is rated **Effective**. The Project achieved 95 percent of its physical construction targets, with over 13,580 kilometers of rural roads constructed or upgraded. It exceeded its target of providing all-weather road connectivity to 4,000 villages, ultimately covering around 6,600 villages. This improved connectivity benefited an estimated eight million people, successfully meeting the Project's objectives. However, the effectiveness was somewhat diminished by the partial delivery of the technical assistance (TA) and institutional strengthening component, as well as the non-implementation of the innovative technology component. Despite these limitations, the Project is likely to have contributed to the intended socioeconomic outcomes. The field-based assessment suggested that the GRRP facilitated economic growth, improved agricultural productivity, enhanced access to healthcare and education, and strengthened social connectivity in the visited villages. Secondary research data assessing nighttime light intensity also suggest that the Project contributed to economic development. AIIB's inclusion of environmental

and social (E&S) safeguards further enhanced the Project's overall impact, though it should be noted that some E&S assessments were conducted retroactively.

EFFICIENCY

The Project is rated **Efficient**. It demonstrated strong economic returns, cost savings, and timely implementation. The Project likely exceeded its intended Economic Internal Rate of Return (EIRR), which was re-estimated by CEIU at 22.8 percent when accounting for agricultural productivity gains, or 14.8 percent excluding these gains, as typically done by other multilateral development banks (MDBs). The Project was largely implemented on schedule, with only minor delays due to an extended monsoon season. A main factor driving efficiency was the 38 percent reduction in actual costs compared to estimates. While these cost savings highlight the Project's efficiency, identifying them earlier could have enabled better use of the funds for additional enhancements, such as road safety improvements or village street lighting—a missed opportunity. Although managing over 1,600 contract packages posed an administrative challenge, this was well-handled by the Implementing Agency. Nevertheless, grouping contracts into larger packages, as done in World Bank and Asian Development Bank projects, could have further eased this burden.

SUSTAINABILITY

The Project is rated **Likely Sustainable**. R&BD demonstrated its capacity to manage and maintain the rural road network effectively. With over 1,400 staff and a well-established organizational structure, R&BD has both the human and financial resources necessary to ensure the continued upkeep of the infrastructure. The inclusion of a defect's liability period in contracts, along with the state's commitment to providing adequate funding for routine and ongoing maintenance, further supports the Project's sustainability. Although the quality of rural roads is not exceptionally high, field observations indicated that four to six years after construction, the roads remained in reasonable operating condition. R&BD also reported that several roads are programmed for overlays as their pavements approach the seven-year design life. The continuous road upgrading and resurfacing program, combined with positive feedback from local communities on maintenance, underscores the project's likely long-term viability. From an E&S perspective, the Project successfully mitigated key risks related to soil erosion, habitat disruption, and minor land acquisition, ensuring these impacts were site-specific and reversible. While there were some delays in environmental assessments and a few technical issues, such as missing drainage structures, the overall design incorporated climate change considerations, enhancing the infrastructure's resilience to extreme weather events.

AIIB WORK QUALITY

AIIB's Work Quality is rated **Satisfactory**. AIIB demonstrated flexibility after engaging in the Project at a late stage and established a strong working relationship with the Implementing Agency. AIIB provided support in financial management, project oversight, and E&S compliance. However, several challenges arose during project implementation, including high staff turnover at AIIB, the absence of a local presence, and the complexity of monitoring numerous contract packages spread across Gujarat. These factors complicated effective project supervision. To mitigate these risks, AIIB engaged Technical Audit consultants for independent oversight of the quality and outcomes of the construction contracts. This proactive approach ensured that civil works adhered to design standards, even without an on-site independent supervision consultant. Given that this was AIIB's first stand-alone operation, the institutional performance risks were heightened due to limited experience in project formulation and implementation. While there were some shortcomings in AIIB's Work Quality, such as gaps in knowledge management, these challenges were not unexpected for a new and expanding institution. A greater local presence by the Bank could have fostered a stronger working relationship between the Implementing Agency and the Bank that would have persevered post-project closure.

CLIENT WORK QUALITY

Client Work Quality is rated **Highly Satisfactory**. This rating is supported by the exceptional performance of both the Borrower and the Implementing Agency throughout the GRRP. Despite the Project being well-advanced before AIIB's involvement, the R&BD demonstrated a high degree of engagement and adaptability to ensure the Project's alignment with AIIB's policies, particularly regarding E&S safeguards. R&BD's experience in rural road program development, particularly from the government-funded PMGSY program, was critical in its effective management of the GRRP. The Implementing Agency successfully handled 1,615 contract packages across 4,682 civil works, including roads and bridges. By project closure, 95 percent of the total works were completed, with the remaining five percent finalized using government resources. This achievement reflects R&BD's strong project management and oversight capacity. Continuous cooperation, professional interaction, and high-level engagement between R&BD and AIIB were instrumental in ensuring the Project was completed on time and in an orderly manner. Additionally, with the support of E&S consultants, R&BD managed E&S risks effectively throughout the Project. While there were some delays in E&S compliance reporting and consultant contracting, these did not strongly impact the overall success of the Project. Strengthening in-house E&S expertise and further building internal

capacity for quality assurance and contract management would enhance R&BD's performance even more.

ISSUES

Issue 1: Significant Difference Between Appraisal and Actual Project Costs.

The Project experienced lower-than-expected expenditure, with disbursements amounting to over 38 percent less than the original estimated costs, largely attributed to competitive bidding and inflated government estimates of unit prices. However, the substantial cost underrun could have been mitigated through a more detailed review during the appraisal stage, particularly since a high proportion of contracts had already been awarded before project approval. Furthermore, the limited flexibility in adjusting the Project's scope and implementation timeline implied that the loan savings could not be redirected toward additional road works or improvements in road safety elements. Earlier recognition of the cost underrun and more timely engagement with the Borrower and Implementing Agency could have facilitated the reallocation of funds to enhance project outcomes.

Issue 2: Limited Monitoring of Outcomes and Efficiency Measurement.

In the context of an early stage of AIIB operations with limited guidance on results measurement, the RMF primarily focused on tracking physical outputs but did not adequately measure the expected socioeconomic outcomes of the Project. This lack of outcome-oriented monitoring limited AIIB's ability to fully assess the Project's effectiveness and the realization of its intended benefits. Additionally, extending monitoring beyond project closure could help identify medium- to long-term benefits and enhance accountability. Furthermore, the absence of a recalculated Economic Internal Rate of Return (EIRR) at project completion constrained the assessment of project efficiency. Recalculating the EIRR upon project completion, a standard practice among MDBs, would offer a more comprehensive insight into the project's overall efficiency and return on investment.

Issue 3: Shortcomings in Implementation Arrangements and Internal Knowledge Management.

The complexity of the Gujarat Rural Road Project (GRRP), coupled with the lack of a local AIIB office and a dedicated supervision consultant, posed challenges for project monitoring and knowledge management. The project's extensive scope, involving

over 1,600 small road work contracts across Gujarat, required robust oversight. Recognizing this need, AIIB engaged a Technical Audit consultant and utilized its own resources to enhance monitoring support. However, ongoing staff transitions and organizational changes within the expanding Bank resulted in multiple shifts in Project Team Leaders (PTLs) and team members, impacting the project's continuity and stability, along with inadequate knowledge management systems, exacerbated the oversight challenges. This lack of continuity undermined effective project supervision, revealing gaps in data management and document archiving. For instance, the final list of constructed roads and bridges was not readily available at AIIB, important project documents had to be sourced from multiple locations, and the Project Completion Note (PCN) provided an incomplete assessment at project closure. A more structured approach to knowledge and document management, coupled with stronger implementation arrangements, would have facilitated more effective oversight and long-term learning from the Project.

LESSONS LEARNED

Lesson 1: Prioritizing Safeguard Implementation and Continuous Monitoring to Mitigate Risks and Promote Sustainability.

Early preparation and implementation of environmental and social (E&S) safeguards, such as Environmental and Social Impact Assessments (ESIA) and Environmental and Social Management Plans (ESMP), is crucial for mitigating risks and supporting sustainability, especially in projects involving retroactive financing. Continuous monitoring through field visits and audits ensures compliance with AIIB's Environmental and Social Policy, helping to address risks and align projects with long-term sustainability objectives. Thorough documentation of E&S records is essential for future assessments, fostering accountability and informed decision-making.

Lesson 2: Ensuring Adequate Time for Thorough Appraisal and Due Diligence to Facilitate Smooth Execution and Minimize Cost Issues.

Sufficient time for technical due diligence during project appraisal is crucial for avoiding issues related to cost estimates and loan structuring. It is recognized that the Bank does not always have full control over project preparation timelines. However, it is essential that adequate time is available during appraisal to meet the AIIB's processing requirements and ensure that project safeguards and policies are adequately met. If timelines are too short, discussions with the proposed client are required to suitably adjust the appraisal preparation timeline to provide adequate

inputs to prepare the project. For short-duration projects, the early identification and implementation of components, such as training activities, are vital, as limited resources and dense schedules can impede effective capacity development initiatives. Thorough preparation allows for smoother execution and helps minimize cost overruns. Additionally, allocating adequate technical sector expertise to Project Teams should be standard practice to ensure quality project delivery and provide necessary oversight during implementation.

Lesson 3: High Capacity in the Implementing Agency, Combined with Flexible AIIB Support, Ensures Success.

A flexible, client-oriented approach from AIIB, along with the extensive experience and capacity of the implementing agency, R&BD, was a main reason for the successful delivery of the Project. AIIB demonstrated a flexible and creative approach while maintaining high standards, which was perceived as a distinctive advantage of working with the Bank. However, an over-reliance of the Implementing Agency on external consultants for core functions, such as project management and environmental and social safeguards, rather than building an in-house capacity, may hinder the Implementing Agency's ability to build its internal competencies. Balancing external support with the development of in-house expertise will enhance the agency's long-term effectiveness and sustainability.

Lesson 4: Streamlining Contract Packaging Can Enhance Project Efficiency.

Managing projects with fewer, larger contract packages can enhance efficiency. The GRRP encountered challenges due to its 1,615 contract packages, which complicated monitoring and implementation. In contrast, AIIB's subsequent projects in India adopted a more streamlined approach with fewer contract packages, aligning with best practices observed in other MDB-supported rural road projects. This shift not only simplifies project management but also improves oversight and execution.

Lesson 5: Fostering Sustainability Through Balanced In-House Capacity Development and Cost-Efficient Outsourcing.

Early engagement with borrowers and communities, supported by a robust Grievance Redress Mechanism (GRM), is essential for building trust and ensuring smoother project implementation. To further improve sustainability and resilience in financed projects, AIIB should also focus on enhancing its supervision of E&S safeguards. This includes ensuring that detailed reviews of the annual monitoring reports submitted by the client are consistently conducted for ongoing compliance and risk management. While developing in-house E&S capacity within local agencies is critical for long-term sustainability, it is equally important to recognize the role of the private sector in offering cost-efficient solutions. A balanced approach that leverages both strong internal capacity and strategic partnerships with the private sector can

optimize resource use, improve project effectiveness, and support sustainability. This dual strategy ensures that projects not only meet immediate objectives but also remain aligned with long-term development goals while managing costs effectively.

RECOMMENDATIONS

Recommendation 1: Strengthen Monitoring of Project Outcomes.

AIIB should enhance its Results Monitoring Frameworks (RMFs) to include both output and outcome indicators, ensuring that expected long-term development benefits are effectively captured. CEIU recognizes that improvements in the guidance on RMFs and its consideration during appraisal have been made and welcomes efforts of Portfolio Monitoring Department and Strategy, Policy and Budget Department to improve the RMF for better monitoring of project outcomes and capturing broader project benefits. Progress indicators should be measured periodically and extend beyond project closure to assess medium- and long-term impacts in PLRs. Furthermore, AIIB should consider including measures during project implementation that would support borrowers to continue collecting relevant data after project completion. The adequacy of the RMF should be a major consideration during the appraisal process to facilitate comprehensive evaluations of project effectiveness and sustainability.

Recommendation 2: Enhance the Assessment of Project Success at Completion.

AIIB should strengthen the quality of its final assessments of projects, as documented in the PCN, ensuring it covers all core aspects of project success and provides a comprehensive analytical evaluation. Adopting the practice of rating project performance would enhance accountability and transparency. CEIU welcomes that in the context of the Corporate Strategy Midterm-Review, it is planned to introduce a Project Completion Indicator and include a rating-based assessment of project success at completion, considering the dimensions of relevance, effectiveness, efficiency, and sustainability. Furthermore, AIIB should implement the common MDB practice of recalculating a project's EIRR at completion. At the time of project completion, one side of the cost-benefit analysis is complete: the final cost is calculated. The recalculation of the EIRR is crucial for assessing project efficiency and evaluating the actual costs and benefits of AIIB investments, ultimately contributing to more informed decision-making and future project planning. It is recognized that full benefits of a project may take years to materialize, which is considered at the time of the PLR.

Recommendation 3: Strengthen Internal Knowledge Management Systems.

AIIB should enhance its internal knowledge management practices to ensure proper project documentation and the preservation of institutional memory, especially during periods of high staff turnover. It is essential that all project-related documents and data are systematically stored, archived, and made easily accessible to staff. CEIU recognizes that the development of knowledge management systems and practices has progressed. However, improving interoperability across AIIB's systems and ensuring consistent knowledge management and archiving practices across departments will contribute to maintaining a robust institutional memory and facilitate effective knowledge transfer, ultimately supporting more efficient project implementation and continuous learning within the organization.

Recommendation 4: Streamline Contract Packages to Support Efficient Implementation.

For future projects that include multiple small scale infrastructure works, AIIB should promote the adoption of a smaller number of larger contract packages to enhance project management efficiency and alleviate the monitoring burden, while accommodating the context and structure of the respective project. Lessons learned from the GRRP indicate that managing numerous small contracts can strain project oversight, making it challenging to ensure timely implementation and quality control. A more streamlined contracting approach will facilitate better resource allocation, improve coordination, and ultimately lead to more successful project outcomes.

Recommendation 5: Strengthen Project Outcomes by Engaging Early and Embracing Flexibility in Implementation.

AIIB should capitalize on its flexible, client-oriented approach as a key strategic advantage. As the Bank expands, prioritizing early engagement with borrowers and implementing agencies is crucial for enhancing monitoring, ensuring compliance with environmental and social safeguards, and facilitating timely project adjustments. This proactive approach will help minimize risks and delays, particularly when project preparation is well underway, by aligning expectations and addressing potential issues at the outset.

Recommendation 6: Expand AIIB's Local Presence to Facilitate Project Oversight and Continuous Client Engagement.

In alignment with the AIIB Approach to Global Presence approved by the Board in August 2024, AIIB should enhance its local presence when large and complex projects are being implemented. Establishing offices or expanding the presence of local representatives/consultants would enable more effective project monitoring, quicker response times, and stronger client engagement, especially for large and complex infrastructure investments. The experience from the GRRP highlights

some of the challenges faced due to limited local oversight, underscoring the need for a more robust presence to facilitate timely decision-making and foster closer relationships with stakeholders particularly post project closure. By investing in local capacity, AIIB can improve project implementation outcomes and ensure a greater alignment with regional needs and priorities.

Management Response

Management welcomes the Project Learning Review (PLR) Report for Gujarat Rural Roads Project (GRRP) prepared by the Complaints-Resolution, Evaluation, and Integrity Unit (CEIU) in accordance with the AIIB Learning and Evaluation Policy (LEP). This Management Response is prepared in accordance with LEP para. 13(f).

Management acknowledges that CEIU assessed the project, which aimed at improving road connectivity for more than 5,900 villages with 8 million inhabitants, as successful. The report recognizes the project was relevant, effective, efficient, and sustainable. Management welcomes the evidence the PLR provided through community voices that the project reduced travel time, supported the use of motorized vehicles, and enhanced passenger safety and comfort.

Since the GRRP was approved in 2017, the Asian Infrastructure Investment Bank (AIIB or the Bank) has adopted a Corporate Strategy and a Transport Sector Strategy and enhanced its policies, guidance, systems, and practices, including the Results Monitoring Framework (RMF) and environmental and social safeguards. Management urges PLR reports to offer lessons learned and recommendations that are explicitly additional to the standards of the Bank at the time of publication, in this case in 2024, or limit the lessons and recommendations to the project subject to the PLR review without extending the lessons and recommendations to the Bank's portfolio. Based on the same logic, and the non-disclosed classification of Early Learning Assessments (ELA) under AIIB's Policy on Public Information, Management requested removal of references to an earlier ELA on the Gujarat project. Going forward, Management encourages CEIU to select the most recent stand-alone financings with disclosed Project Completion Notes for PLR to enhance timeliness and relevance. Management would also welcome PLRs be more succinct and avoid repetition between issues, lessons and recommendations to maximize reader engagement.

Management extends its appreciation for the collaborative approach used in this PLR and the constructive engagement of the Evaluators with the project team, the Client, stakeholders and Management, which have yielded novel insights and lessons learned. We look forward to future reports.

Management is pleased to share the following response to the recommendations in PLR report:

Recommendation 1: Strengthen monitoring of project outcomes.

Management recognizes the importance of measuring project outcomes indicating direct changes in access or level of services of infrastructure and has already strengthened guidance, tools, training, and quality assurance. Management has

made the adequacy of the RMF a major consideration during project appraisal, including the inclusion of both output and outcome indicators.

Management disagrees with the recommendation to monitor project outcomes after the project closure. Management's ability to systematically monitor project outcomes beyond project closure is limited. Management would welcome insights on MDB practice in this respect.

Consistent with its peers, AIIB's project-level RMFs focus on the direct or primary effects of its financing, not indirect, beyond project intervention, higher-order effects, or impacts. The PLR reported that local communities attributed to the Project improvements in educational attainment, health care, agricultural productivity, and social connectivity, among other impacts. Management would like to clarify that it considers these impacts to be outside the scope of the project-level RMF. AIIB measures indirect and induced effects of transport infrastructure on the economy and society through scientific impact research conducted by its Economics Department on a selective basis, including the GRRP. On a sample basis, the Economics Department will continue to undertake select impact studies for investments that are evaluable and of high learning potential.

Recommendation 2: Enhance the assessment of project success at completion.

Management agrees with this recommendation and will update the Project Completion Note template. Management will introduce a project success rating at completion to track the achievement of project development objectives and enhance learning. However, Management noted that AIIB's Learning and Evaluation Policy (Guide: Criteria para. 65) does not recommend one overarching project rating.

The PLR further recommended that AIIB computes a closeout Economic Internal Rate of Return (EIRR) at project completion in addition to the ex-ante EIRR used for Investment appraisal. Management disagrees with this recommendation. Cost-benefit analysis is an extremely valuable tool for decision-makers, in this case transport planners, to appraise projects and facilitate the allocation of scarce financial resources. A closeout EIRR would still rely on forecasts for long-term benefits and would have little added value for decision-makers of the concerned project that is already closed. Management welcomes independently evaluated ex-post EIRRs for learning purposes.

Recommendation 3: Strengthen internal knowledge management systems to support institutional memory development and knowledge transfer.

Management agrees with this recommendation. The AIIB is continuously strengthening and developing digital solutions for document management and lesson learning through its Investment Management Information System (IMIS) and other initiatives. Management recognizes the need to further continue to improve the archiving of project records and internal knowledge management to ensure project continuity and facilitate oversight and long-term learning.

Recommendation 4: Streamline contract packages to support efficient implementation.

Management disagrees with the assessment of the procurement strategy of the GRRP provided in the PLR. The PLR noted that the project's extensive scope involved over 1,600 small road work contracts across Gujarat, requiring robust oversight. Management recognizes that the large number of small contracts was challenging in the implementation of the GRRP. However, the PLR did not provide evidence for alternative procurement strategies being more fit for purpose and bringing more value for money in the GRRP. Management does not use procurement strategies in abstraction of the project delivery strategy, policy objectives, and the marketplace.

Recommendation 5: Strengthen project outcomes by engaging early and embracing flexibility in implementation.

In the spirit of continuous improvement in AIIB's Corporate Strategy, Management agrees with this recommendation and confirms the importance of early engagement with borrowers and facilitating timely project adjustments. Management continues to refine its reporting tools for timely response to issues, particularly through enhancing early issue reporting and response in Project Implementation Monitoring Reports (PIMR) for adaptive management and decision-making.

Recommendation 6: Expand AIIB's local presence to facilitate project oversight and continuous client engagement.

Management agrees with this recommendation. Management confirms its support for the use of local representatives or consultants where appropriate and relevant.

Introduction

PROJECT DESCRIPTION

1. The Complaints-resolution, Evaluation, and Integrity Unit (CEIU)[1] conducts independent evaluations of completed stand-alone projects. Guided by the Asian Infrastructure Investment Bank's (AIIB) Learning and Evaluation Policy, CEIU conducts Project Learning Reviews (PLRs) for completed stand-alone projects.[2] The PLRs assess the achievement of project objectives and the performance of AIIB and the Client; identify drivers of success; and draw lessons of experience. Following CEIU's approach of being "independent and engaged," the PLRs are prepared by staff and senior sector experts from CEIU in close collaboration with the relevant operating department. PLRs are conducted after AIIB Management submits the Project Completion Note (PCN) for a project to the AIIB Board. After Board discussion, the PLRs are made publicly available on the AIIB website.

2. The Gujarat Rural Roads Project (GRRP, the Project) in the Republic of India marked AIIB's first stand-alone financing in the roads sector, making it a highly relevant Project for the AIIB to assess and learn.[3] In 2017, AIIB approved a loan to the Republic of India to support the Government of Gujarat's Chief Minister's Rural Roads Program (Mukhya Mantri Gram Sadak Yojana, or MMGSY). The overall MMGSY program that was implemented from FY2016/17 to FY2020/21 aimed to improve rural road connectivity for 17,843 villages, thereby expecting to benefit about 20 million people. Under the GRRP, AIIB supported MMGSY Phase 1, which was implemented during the initial two-year period from FY2016/17 to 2017/18. Following the appraisal mission and loan negotiations in May 2017, AIIB approved a USD329 million loan to the Government of India on July 4, 2017, to finance 50 percent of the total project cost. The Project was implemented by the Roads and Buildings Department (R&BD) of the Government of Gujarat.

3. The objective of the GRRP was to improve rural road connectivity for 4,000 villages in all 33 districts of the state, thereby benefiting about eight million people. The Project was expected to "provide all-weather road access, economic benefits, and social services for the rural population."[4] Anticipated benefits included improved transportation modes; better access to schools, healthcare, and administrative services; and increased agricultural productivity, industrial development, and new employment opportunities. The Project originally consisted of four main components: (i) the construction and upgradation of Non-Plan Roads (NPRs); (ii) the upgradation of Plan Roads (PRs) that provide first-level connectivity to

1 See: Introduction to CEIU - Complaints-resolution, Evaluation and Integrity Unit (CEIU) (aiib.org)
2 See: AIIB Learning and Evaluation Policy
3 See: India: Gujarat Rural Roads (MMGSY) - Projects - AIIB
4 See: Project Summary Information (p. 2)

villages; (iii) provision of technical assistance (TA) to support project implementation and build capacity in the implementing agency; and (iv) the application of innovative technologies in the rural roads sector.[5] AIIB approved a separate TA in January 2018 to support project implementation quality by financing sample Technical Audits of selected subprojects. This TA was an integral part of the GRRP project and is assessed together with the project in this PLR.

PLR PURPOSE AND PROCESS

4. The purpose of this PLR is to assess the results achieved under the Project, understand their drivers, and derive lessons for continuous improvement in AIIB's processes and project financing. In accordance with AIIB's Learning and Evaluation Policy, the PLR evaluates the attainment of project objectives and the performance of the Bank and the Client.[6] The assessment of the achievement of project objectives utilizes the four OECD/DAC criteria outlined in the AIIB Learning and Evaluation Framework (LEF) Guide on Evaluation Criteria: Relevance, Effectiveness, Efficiency, and Sustainability.[7] Each criterion is rated on a four-point scale and an overall project rating is then derived from these assessments. Additionally, the PLR examines and assesses AIIB and Client Work Quality, using a four-point rating scale. Appendix A provides the detailed Evaluation Framework and rating scales.

5. The PLR assessment is based on quantitative and qualitative evidence collected by the CEIU team through field visits, interviews with project stakeholders, and a document review. The PLR builds on an Early Learning Assessment (ELA) that was conducted on the GRRP by CEIU in 2020.[8] The PLR draws on several sources of information including (i) site visits and interviews with project stakeholders in Gujarat and New Delhi conducted from August 20 to 29, 2024; (ii) discussions and interviews with AIIB staff; and (iii) desk reviews of AIIB and client project and sector documents, government strategy and policy documents, and official socioeconomic indicators. The evaluation team held discussions with the Implementing Agency, the project management consultants, the Environment and Social (E&S) consultants, the Technical Audit team, two contractors, other

5 Non-Plan roads are defined as second and third level connectivity roads to villages (i.e., any road below first level connectivity).

6 See: AIIB Learning and Evaluation Policy; Better Criteria for Better Evaluation | OECD

7 See: AIIB LEF Guide on Evaluation Criteria

8 CEIU conducts ELAs for ongoing projects to derive lessons of experience for AIIB. The GRRP was selected for the fourth ELA undertaken by CEIU. The ELA was prepared in 2020, at a late stage of project implementation. It involved both deskwork and site visits in Gujarat in conjunction with a management implementation support mission. The report was prepared in consultation with the Project Team and Management and discussed by the Executive Committee and the Policy and Strategy Committee of the Board.

international financial institution rural roads specialists in the country, and a nongovernment organization working on road safety. Furthermore, the evaluation team visited 13 villages that benefited from the GRRP. The village sample aimed at covering villages with different characteristics in terms of village size, geographic location, and the type of works conducted under the GRRP (see Appendix C for a detailed description of the village site visits). In each village, the evaluation team met the responsible district engineer from R&BD, visited the road/bridge that was constructed/improved, and conducted a focus group discussion with members of the community, including the head of the village *(sarpanch)*, teachers, health workers, and farmers. The CEIU team faced some challenges in terms of data collection due to staff turnover in the Project team and the unavailability of some documents due to the absence of a structured project documentation system. The GRRP Project was developed and executed during the early phase of the Bank's establishment. CEIU recognizes that processes and procedures have evolved since then.

6. **The PLR report underwent a rigorous quality assurance and review process.** This included an internal CEIU peer review process, and an external peer review by transport evaluation expert Toshiyuki Yokota. Following internal clearance, CEIU requested feedback from the Project Team and Management, prior to issuing the final report. This is the first PLR undertaken by CEIU and therefore pilots CEIU's approach to conducting PLRs, which may be further refined in the future.

7. **The report is organized into five sections.** Chapter One introduces the Project and its objectives and processes. Chapter Two provides a detailed overview of the Project's design and implementation. Chapter Three evaluates the project's performance across key criteria, including relevance, effectiveness, efficiency, and sustainability, followed by an overall assessment. Chapter Four examines the quality of work conducted by both AIIB and the client, with ratings for each evaluation criterion. Chapter Five concludes the report with a discussion of the main issues, lessons learned, and derived recommendations.

Project Design and Implementation

RATIONALE AND OBJECTIVES

8. The Government of India has identified inadequate rural road connectivity as a significant obstacle to poverty reduction and economic growth in rural areas. In 2000, the Government commenced a nationwide Prime Minister's Rural Roads Program (Pradhan Mantri Gram Sadak Yojana, [PMGSY]) which was funded and managed by the Ministry of Rural Development with support from international financial institutions (IFIs). The PGMSY was implemented through state governments and focused on providing road connectivity for villages of 1,000 or more people in the plains, and for villages of 500 persons or more in hilly, tribal, and desert areas.[9]

9. The Government of Gujarat launched its Chief Minister's Rural Roads Program (MMGSY) to further enhance rural socioeconomic development. Located on the western coast of India, Gujarat is the sixth-largest state of India and one of the leading states in terms of industrialization. At the end of March 2017, Gujarat had achieved 98 percent of its PMGSY road building and refurbishment targets.[10] However, pockets of rural poverty remained, particularly in remote and hilly areas that had higher proportions of Scheduled Tribes and Scheduled Castes. To address this, the Government of Gujarat launched the MMGSY to further improve the rural road network. The program adopted many core features of PMGSY, including standardized road designs, procurement arrangements, and oversight measures.

10. The MMGSY aimed to provide sustainable, safe, and all-weather connectivity to small villages and improve the mobility of the rural population of Gujarat. The purpose of the MMGSY was to provide first level connectivity to villages with populations below 500 people in the plains and below 250 people in hilly, tribal, and desert areas; and to upgrade/resurface first level connectivity roads and provide second and third level connectivity for larger villages.[11] The MMGSY was implemented in two phases. The first was implemented from 2017 to 2019 with the support of the AIIB and the second phase was scheduled to commence in 2020.

11. The expected output of the AIIB-supported first phase of the MMGSY was to support 4,000 villages with 8 million beneficiaries. While the overall MMGSY was expected to support 17,843 villages with 20 million people, the first phase that was supported by AIIB targeted 4,000 villages with 8 million beneficiaries.[12] The primary expected beneficiaries were villagers who used the rural roads, and

9 See: Project Document (p. 4)

10 See: Project Document (pp. 4-5)

11 R&BD informed the evaluation team that these population numbers only refer to villages requiring first level connectivity. Villages with second and third level connectivity requirements are often significantly larger in size.

12 See: Project Document (pp. 4-5; 23)

secondary beneficiaries were service providers to the rural population.[13] The Project was expected to provide 364 villages with new first connectivity, and 3,650 villages with new second and third connectivity by providing 14,825 kilometer (km) of road works and 93 missing links/bridges. The RMF details the Project output targets by category of road works as shown in Table 3 (on page 43).

12. The expected outcome of the Project was to enhance economic development and social service delivery in the entire state of Gujarat by integrating isolated and poor rural populations with the rest of the state and markets. The Project Document describes the following expected outcomes:[14]

Increased agricultural productivity and industrial development.

Reduced travel time.

Increased literacy through better access to schools and more schools being built.

Better health care access with more health care centers established.

New employment opportunities during project implementation and after.

Changed transport mode from bullock cart to motorized vehicles.

Reduced vehicle operating costs and improved passenger safety and comfort.

Improved access to administrative services, law and order, and welfare establishments.

DESIGN

13. The opportunity to finance part of the MMGSY came to AIIB's attention during the Government of Gujarat's Vibrant Gujarat conference in January 2017. The Ministry of Finance of India requested the Bank to consider providing a sovereign-backed loan of USD690 million (INR46 billion) in two tranches for the entire MMGSY, which was estimated to cost USD1.5 billion (INR100 billion) in total.[15] AIIB responded quickly to provide a loan for the first phase of MMGSY.

13 See: Project Document (p. 6)

14 See: Project Document (p. 6)

15 The AIIB did not support the second phase of the MMGSY. The second phase is currently being implemented by the New Development Bank and the loan of USD500 million was approved in November 2023. See: Gujarat Rural Road Program - New Development Bank (ndb.int)

14. On July 4, 2017, the Board approved a USD329 million loan to the Government of India to cover 50 percent of the estimated project costs of the MMGSY Phase 1. The loan would finance MMGSY roadworks approved by the Government of Gujarat in its budget plan for 2016-2017, including 20 percent retroactively (see Chapter 3.3. for the cost estimates by component). The loan had a final maturity of 13 years, including a grace period of five years, with customized repayments at the Bank's standard interest rate for sovereign-backed loans.[16] The loan agreement was signed on Aug. 4, 2017, and became effective on Oct. 26, 2017.

15. The project design included four project components. These were:

- **Component 1: Construction and upgradation of NPRs.** The construction element included the provision of asphalt surfacing on about 5,045 km of existing cart tracks and earthen links and the upgradation element included strengthening and resurfacing of 2,518 km of existing asphalt roads not resurfaced in the past 10 years. Furthermore, the component comprised the construction of 593 km of first-level connectivity roads (new road links to previously unconnected villages), about 800 km of missing links, and about 40 bridges and culverts. Finally, the component encompassed the construction of approach roads to educational institutions and schools and the construction and upgradation of about 233 km of roads in areas inhabited by Scheduled Tribes.[17]

- **Component 2: Upgradation of PRs that provide first-level connectivity to villages.** This comprised the upgradation of about 206 km of existing roads from gravel to asphalt, the upgradation of about 237 km of earth roads to asphalt surfacing, and the resurfacing of 4,386 km of village and other district roads. The component further comprised the upgradation of about 24 causeways and bridges to all-weather standards to prevent flooding and subsequent isolation of flooded villages during monsoon season; and the widening of 1,600 km of village and other district roads to ease traffic passage.

- **Component 3: TA through three elements.** This component included:
  - Engaging a Project Management Consultant (PMC) to assist R&BD in project management areas such as planning, implementation supervision, monitoring, and progress reporting.

16 See: Project Document (pp. 10 and 13)

17 The Scheduled Tribes is one of the officially designated groups of historically disadvantaged Indigenous Peoples. The term Scheduled Tribe is a recognized term in the Constitution of India. See: Project Document (p. 19)

- Developing digitized maps of Gujarat's rural road network and connecting them with a Geographical Information System to enable real time communication, updates on construction progress, and updates on maintenance works.
- Institutional development and capacity building of R&BD through training, workshops, and study tours.

- **Component 4: Application of innovative technologies in the construction, upgradation, and maintenance of rural roads and structures on an experimental basis.** Innovative technologies to be applied included the use of recycled plastic waste, modified bitumen, additives, geo-textiles, soil stabilization techniques, slope protection techniques, and mechanized routine maintenance.

Table 1: Summary of GRRP Risks and Mitigation Measures[18]

Risks Identified at Appraisal	Likelihood (H, M, L)	Mitigation Measures Proposed
Risk 1: Project Implementation – Technology, concept, methodology and strategy.	L	The professional skills, technology and experience are adequate for timely and orderly implementation of the Project. The technology used is conventional and well within the capabilities of the R&BD.
Risk 2: Procurement – Transparency of e-tendering system.	M	A live demonstration of e-tendering was shown to the Bank's team and the system is well-designed to prevent any transparency related issues.
Risk 3: Procurement – Delays in tendering, contract finalization and award.	M	A detailed and realistic procurement plan was prepared by the R&BD, reviewed, and will be monitored by AIIB.
Risk 4: Project Implementation – Delays and quality monitoring.	M	The Bank team reviewed a pilot presentation of the Road Progress Monitoring System (RPMS) and found it effective, practical, and appropriate for day-to-day quality and quantity financial control of the Project.
Risk 5: Environmental and Social – Implementation of the ESMF/ ESMP/Tribal Population Planning Framework (TPPF) by the local contractors.	M	The consultant hired by the R&BD for preparation of the ESMF, ESMPs, and TPPF is also responsible for providing training to the field engineers of the R&BD and to the contractors. The PMC and the Bank will monitor effective implementation of the ESMF/ESMPs/TPPF.

18 See: Project Document (pp. 21-22)

16. AIIB assigned a risk rating of "Medium" to the Project. The Project Document identified five main areas of risk and proposed relevant mitigation measures, as summarized in Table 1 above.[19] Risk 1 relating to Project Implementation was assessed as low largely due to 75 percent of the 1,600 contracts already being awarded and construction under many contracts already completed. The other risk areas relating to procurement transparency, procurement delays, monitoring construction quality, and E&S risks were assessed as medium. During appraisal, an AIIB review of the bidding process found that the bidding process was in line with that of AIIB's procurement policy.

IMPLEMENTATION

17. The GRRP was implemented on schedule from August 2017 to August 2019. The Project developed a web-based project monitoring system to monitor the physical and financial progress of the civil works and status of the quality monitoring system. The Project initially did not have a separate supervision consultant as this role was fulfilled by the Implementing Agency. A PMC was engaged to coordinate and report on the overall program that was spread over 33 districts. The need for a separate supervision consultant was subsequently acknowledged by AIIB, and a Technical Audit consultant was recruited using AIIB TA resources to independently assess the technical outputs resulting from the construction contracts. The procurement was packaged into numerous small contracts, with 1,615 contract packages covering 4,692 civil works issued by project completion. When the AIIB loan became effective, most civil works contracts had already been awarded and a large share of the road works had been completed. The AIIB loan provided retroactive financing for a portion of these contracts (20 percent of the loan). Table 2 on the following page summarizes implementation progress, as described in the Project Implementation Monitoring Reports (PIMRs).

18. At completion, the Project had achieved over 95 percent of its physical construction targets. Under Components 1 and 2, after 2.5 years of implementation, the Project achieved over 95 percent of its physical construction targets and provided improved connectivity for over 6,600 villages across the 33 districts of Gujarat. Under Component 3, a digitized map was proposed but subsequently canceled as the Government of Gujarat decided to develop a digitized map through a different program. Under Component 3, the institutional development and capacity building efforts were constrained by the short loan implementation period of two years and a lack of pre-planning of training programs. As a result, the Project conducted significantly fewer workshops and study visits than originally planned, which resulted in reaching only 15 percent of the expected disbursement

19 See: Project Document (pp. 21-22)

amount of Component 3. Under Component 4, the Implementing Agency had initially planned to experiment with innovative technologies for road construction, upgrading, and maintenance. This component had received strong backing from the AIIB Board at the time of project approval. However, the AIIB subsequently decided not to move forward with these technologies due to concerns about their potential negative environmental impacts.

Table 2: Key Features of GRRP Implementation Progress[20]

	Physical Progress	E&S Compliance	Procurement
2017	36% completed (on track).	Components 1 and 2 "Ongoing"; Components 3 and 4 "Not started".	Components 1 and 2 completed 90%. Component 3 and 4, not started.
2018	Component 1, 67%; Component 2, 63%; Component 3, 25%; Component 4, 15%.	"In compliance."	Components 1 and 2 as for 2017. Component 3, 80%; and Component 4, 20%.
2019	Components 1, 2, and 4, 80% completed. Component 3, 20%.	"In compliance." However, "Monitoring reports for E&S documentation and instruments outstanding for more than 6 months" identified as a risk.	Components 1, 2, and 4, 100% completed. Component 2, 30% completed.
2020	As for 2019.	As for 2019.	As for 2019.

19. The Project experienced lower-than-expected expenditure, with disbursements amounting to over 38 percent less than the original estimated costs. This can be attributed to several factors, including procurement efficiency achieved through an e-tendering system, a high level of competition via national competitive bidding and overestimation of project costs. These factors accounted for about 30 percent of the reduced use of AIIB funds. Additionally, the 2.5 percent retention for future maintenance requirements and taxes and duties were covered by government funds, rather than AIIB disbursements, resulting in a lower application of AIIB loan funds. For Component 3, lower disbursements were due to the Government of Gujarat's decision to develop a digitized map through a separate program and less capacity building activities carried out than planned. Component 4

20 Source: Project Implementation Monitoring Reports (PIMRs). See: India: Gujarat Rural Roads (MMGSY) - Projects - AIIB

was not implemented due to concerns about the potential environmental impact and safety of the proposed innovative technologies. AIIB, along with the Department of Economic Affairs and the Government of Gujarat, increased AIIB's share of the overall project costs of Component 1 and 2 to 70 percent to ensure that the AIIB loan was fully utilized (see Chapter 3.3. for details).

20. AIIB conducted six visits for monitoring purposes during project implementation. The first visit was conducted on Oct. 9-13, 2017, and the last visit from Jan. 20-24, 2020. A digital Road Progress Monitoring System (RPMS) was commissioned by R&BD to track the progress of all contracts in each year of the MMGSY in detail. The RPMS operated reasonably well in practice and was a key source of information for progress reporting to AIIB.

ENVIRONMENTAL AND SOCIAL SAFEGUARDS

21. The GRRP was classified as Category "B" under AIIB's Environmental and Social Framework (ESF).[21] The Project posed significant but manageable E&S risks, which were site-specific and reversible. Three of AIIB's Environmental and Social Standards (ESS) were triggered. ESS 1 ensured proper assessment and mitigation of E&S risks. ESS 3 focused on safeguarding indigenous communities, as four percent of the roads were planned to be constructed in districts with Scheduled Tribes. ESS 5 ensured fair labor practices and safe working conditions. As required by AIIB's ESP for Category 'B' projects, an Environmental and Social Impact Assessment (ESIA) was conducted and an ESMF was developed, which provided for the use of ESMPs.[22] A Tribal Population Planning Framework (TPPF) was prepared to address approaches to project planning and management in areas inhabited by Scheduled Tribes.[23]

22. Most of the civil works financed under the GRRP were assessed for E&S compliance retroactively. The Implementing Agency contracted a consulting firm to carry out E&S assessments and monitoring during implementation. At the project launch in May 2017, a portion of the roads had already been completed and the AIIB loan provided retroactive financing. However, the engagement of the E&S consultants took time to complete, and they were only fielded 9 months after loan approval, by which time a high proportion of the civil works had been completed. As a result, many of the roads were assessed for E&S compliance retroactively. Reporting on E&S compliance was done quarterly starting in mid-2018.

21 See: AIIB Environmental and Social Framework ESF June 2024

22 See: Gujarat Rural Roads (MMGSY) - ESIA (aiib.org); and ESMF_MMGSY_Gujarat.pdf (aiib.org)

23 See: TPPF_MMGSY_Gujarat.pdf (aiib.org)

Project Assessment

RELEVANCE

23. The GRRP was well-aligned with the country and state priorities of improving rural road connectivity to support economic growth and poverty reduction in rural areas. The Government of India had identified the issue of inadequate road connectivity and established the PMGSY program in 2000 that aimed to provide all-weather road connectivity to underserved villages in India's rural areas. The IFI-supported PMGSY substantially increased rural road connectivity and brought sizable socioeconomic benefits to the rural population.[24] In Gujarat, as 47 percent of the population lives in rural areas, rural connectivity and its consequent socio-economic development are key for poverty reduction. By 2017, Gujarat had achieved 98 percent of its PMGSY targets and had developed one of the best road networks in the country. However, continued pockets of rural poverty remained in remote and hilly areas.[25] To further improve the rural road network and extend the benefits of improved connectivity to villages below 500 people, the Government of Gujarat launched the MMGSY in 2016. The state planned to allocate INR100 billion (USD1.5 billion equivalent) to implement the MMGSY in FY2017–FY2021, with a target of supporting 20 million people in 17,843 villages.[26]

24. The GRRP was generally well-aligned with AIIB's mandate and mission and was of high importance for the institutional development of AIIB as one of its first stand-alone projects. AIIB aims to finance the "infrastructure for tomorrow", with a commitment to sustainable investments and improving quality of life. The GRRP was aligned with this mission as the Project focused on building sustainable road infrastructure to improve the livelihoods of rural people.[27] While the GRRP was approved before the publication of the AIIB Transport Sector Strategy in 2018, the Project fits well into the overall objective of the Transport Sector Strategy of financing the "development of sustainable and integrated transport systems that promote trade and economic growth in Asia."[28] However, the Project does not align with the highest priorities of the 2018 Transport Sector Strategy, which are to finance economically viable trunk linkages and strategic infrastructure projects in the 'middle range' of financial viability, as the GRRP was a Project with low financial viability as rural roads to not generate a revenue stream.[29] Despite the strategic alignment, it needs to be highlighted that the GRRP was among the first AIIB stand-alone financings and the first stand-alone project in the road sector. The Project thereby

24 See: World Bank Group Assessment of PMGSY

25 See: World Bank Group: Gujarat Social Inclusion

26 See: Project Document (pp. 4-9)

27 See: Overview - Infrastructure for Tomorrow - AIIB

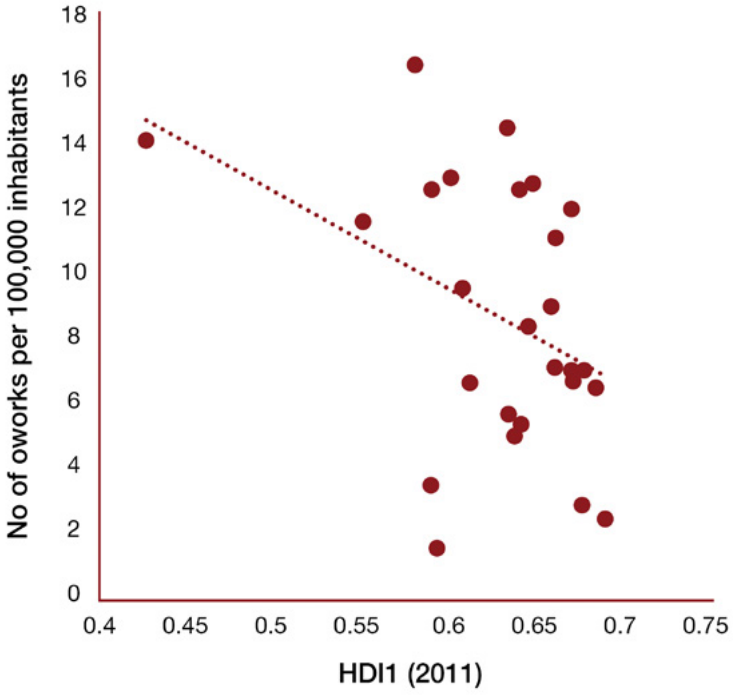
28 See: AIIB Transport Sector Strategy (p. 2)

29 The middle range comprises projects with significant economic return but without sufficient financial return that would attract stand-alone private finance. See: AIIB Transport Sector Strategy

provided AIIB with an important opportunity to further develop its expertise and capacity in stand-alone financing of core infrastructure in its early years of operation.

25. The Project design, in terms of the distribution of civil works across the state, was appropriate for improving the equality of socioeconomic development outcomes in the state. The GRRP comprised 4,680 road works in all 33 districts of Gujarat. The CEIU team conducted a spatial analysis of the distribution of road works, mapping the Human Development Index (HDI) of each district as a measure of socioeconomic development against the number of works per 100,000 inhabitants in a district as a measure of intensity.[30] The analysis as depicted in Figure 1 shows a negative relationship between the number of road works per 100,000 inhabitants and the HDI, indicating that the intensity of road works was higher in districts with a lower level of socioeconomic development as measured by the HDI. Thus, the spatial analysis underscores that the interventions of the GRRP tend to be distributed in alignment with the different socioeconomic development needs in the districts of Gujarat. Furthermore, one sub-component of the GRRP specifically targeted the construction and maintenance of roads passing through tribal areas. This was particularly relevant for achieving the envisaged outcomes, as Scheduled Tribes had a higher incidence of poverty and slower poverty reduction than other social groups in the state of Gujarat.[31] The Implementing Agency also cited strong demand from local communities for essential transport infrastructure.

Figure 1: Spatial Analysis of the GRRP Road Works per 100,000 Inhabitants and the HDI by District.



Source: CEIU Analysis

30 The HDI provides a summary measure of average achievement in key dimensions of human development with a value between 0 (lowest possible value) and 1 (highest possible value). See: Human Development Index | Human Development Reports (undp.org). The district-level HDI used here was calculated by Viswanathan & Bahinipati (2021) based on the 2011 census See: Viswanathan & Bahinipati (2021). Growth and human development in the regional economy of Gujarat, India: an analysis of missed linkages. Journal of Social and Economic Development, pp. 25-47.

31 See: World Bank Group: Gujarat Social Inclusion

26. The Project design was appropriate to meet the transport needs of the rural population. The engineering designs used in the GRRP were similar to the engineering designs employed in the earlier PGMSY program, which had proven suitable for developing rural road networks.[32] The designs followed the recommended design codes of the Indian Roads Congress.[33] The civil works under the Project were not technically complex and were appropriate for local road network development. Depending on traffic flow, the road carriageway varied from an initial width of 3.75 meters (m) to 7.00 m with shoulders and side drainage. Surface layers were either bitumen seal coats or cement concrete, with the latter often used where water levels might overflow onto the road in peak rainfall situations. The designs incorporated climate change considerations by utilizing higher rainfall intensities and flood data in drainage calculations. R&BD indicated that roads are often widened within 10 years of upgrading in line with increasing levels of traffic. The Project was well-received by the local population, with residents in the villages visited by the CEIU team expressing satisfaction and relief at finally having received the road infrastructure.

27. The PLR team identified design weaknesses that affected the Project's effectiveness and sustainability. Notably, the road design could have better addressed climate change impacts and safety measures. Although the Project Document claimed to incorporate climate considerations, it did not specify the additional works needed to meet updated criteria. The GRRP Technical Audit revealed that road safety standards on the reviewed roads were consistently below average, a concern that AIIB noted was insufficiently addressed in discussions about undisbursed funds. Suggested improvements included installing solar streetlights, creating clear sidewalks, adding road shoulders, and Grievance Redress Mechanism (GRM) for each cluster of subprojects. However, community concerns were primarily channeled through Local Self Government, which was already a standard practice under PMGSY. AIIB could have better integrated this approach into the project design. Lastly, discussions with the Implementing Agency revealed that while funds under Component 4 were not disbursed, innovative technologies were adopted during the GRRP. [34] The Implementing Agency indicated that the concerned technologies were integral parts of the main contracts and could therefore not be easily separated for disbursement under an additional Component. This issue could have been mitigated with better planning during appraisal, particularly in establishing a clear agreement on the disbursement processes.

32 See: World Bank Group Assessment of PMGSY

33 The Indian Roads Congress is the Apex Body of road sector engineers and professionals in India. See: Indian Road Congress (irc.nic.in).

34 The PMC's completion report indicates that a total of 453 projects incorporating innovative technology were implemented covering 1,249.65 km of rural roads.

28. The RMF was focused on physical outputs rather than the envisaged broader outcomes of improved economic and social conditions attributable to the improved rural roads. The RMF indicators were largely centered on physical outputs (kilometers of roads by road type) rather than economic and social outcomes that resulted from the use of the roads. The RMF and the Project Document did not set out expected outcomes and impacts to explain how the project outputs would contribute to the achievement of the broader development objectives. Since the primary rationale for investing in road assets is to improve the well-being of rural residents, indicators that measure such broader achievements beyond the provision of physical assets (comprising inputs and outputs) are important in an RMF. CEIU recognizes that the Project was prepared at an early stage of AIIB operation with limited guidance on results measurement and monitoring. An expanded RMF complied by CEIU that includes the envisaged project outcomes is presented in Appendix B.

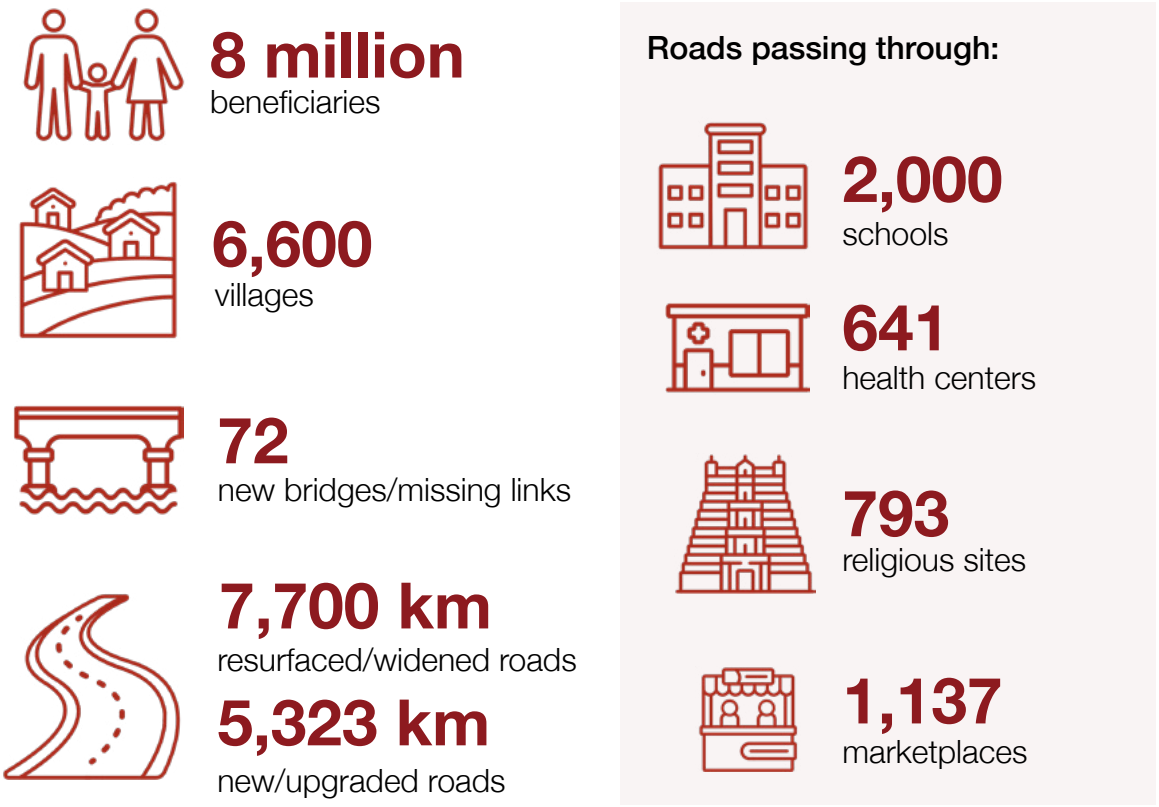
29. Overall, the PLR rates the Project as *"Relevant."* The Project was aligned with the priority needs of the state of Gujarat and the national objective of improving physical connectivity in disadvantaged rural areas. The Project was designed to support increased economic and social activities in rural communities and provide greater opportunities for residents to participate in economic growth. It was consistent with AIIB's mission of providing "infrastructure for tomorrow" and held significance for the institutional development of AIIB as its first stand-alone road project. The distribution of works under the Project was well-aligned with development needs across the state, and the design appropriately addressed the rural population's transport requirements. However, the Project experienced some design weaknesses, and the RMF was not robust enough to adequately capture the anticipated outcomes.

EFFECTIVENESS

30. The Project achieved its expected output of improving all-weather rural road connectivity to 4,000 villages in all 33 districts of Gujarat. The Project provided new connectivity to 698 villages and improved second- or third-level connectivity to 5,902 villages, exceeding the target of 4,000 villages. The estimated target of eight million beneficiaries, counted as the population living in villages that received road and bridge works under the GRRP, was successfully reached. However, there was a discrepancy in the reporting of the total number of beneficiaries in the PCN, which incorrectly stated that there were 21 million beneficiaries. This larger figure reflects the total number of beneficiaries reached by the entire MMGSY program that ran from 2016/2017 to 2020/2021. AIIB's involvement, however, was limited to the initial two years of the MMGSY, which ran from 2016/2017 to 2017/2018. During this earlier phase, eight million beneficiaries

were directly impacted. This distinction in the project duration and scope accounts for the misreporting of the number of beneficiaries in the PCN.[35] Beyond the RMF indicators, the PMC also monitored the schools, health centers, religious sites, and marketplaces that the constructed/upgraded roads improved access to, as shown in Figure 2.

Figure 2: GRRP Outputs.[36]



31. The road and bridge works output targets for Project components 1 and 2 were mostly achieved. The Project realized substantial physical achievements over its two-year implementation period. By December 31, 2019, the Project had completed about 13,580 km of rural roads improvements, which was over 95 percent of the target for physical works. Table 3 provides the baseline, target, and actual value for each RMF indicator. Overall, the Project exceeded its targets for the number of villages, while construction output in terms of kilometers of roads and numbers of bridges/missing links was slightly below target levels. For the upgradation of earthen to black-top surface roads, issues such as land availability and roads passing through reserved forest areas affected achievement of targets during the project timeframe. For some road works and the upgradation of existing

35 Source: PCN (p. 4); additional reporting obtained from the PCM during the site visit.

36 Source: PCN; additional reporting obtained from the PMC during the site visit.

causeway/deep to high-level bridge, works could not be completed by the closing date because a heavier and longer monsoon impacted the work progress. These works continued into 2020 and were completed with funding from the Government of Gujarat.[37] The distribution of the road and bridge works allowed more villages than initially planned to benefit from the works (see Table 3).

32. The third Component aimed at institutional strengthening was only partially implemented and did not fully achieve its expected outputs. Of the USD3.0 million allocated for TA only USD0.44 million was disbursed. The primary reason for this shortfall was the limited time available during project implementation to arrange training and learning activities. This was largely due to the Project's short two-year implementation timeframe. In retrospect, the short timeframe and advanced nature of project implementation when AIIB engaged required an upfront plan for training to enable timely implementation. This component was not fully achieved due to the need to focus on other project areas and the limited resources allocated to the PMCs work. If additional resources had been allocated to the PMC for the creation and management of training activities, the funds set aside for training under the Project could have been utilized more effectively. While the computer system development of the RPMS was completed, discussions with project stakeholders revealed that it was not consistently used by district-level engineers, did not consistently utilize it, which limited its overall effectiveness.[38]

33. Funding under the fourth component for innovative technologies was not used. The PCN noted concerns about the potential impact on groundwater and the unclear safety of the proposed additives and treatments for innovative technologies in road construction as reasons for the cancellation of the Component. However, the R&BD project completion report indicates that innovative technologies were, in fact, used in 453 projects, covering 1,252 km of road length. The use of these technologies was a key aspect of the PGMSY program, and similar provisions for implementing them were also included in the standard construction contracts for rural roads under the MMGSY program. Discussions with the Implementing Agency revealed that the non-disbursement of funds under Component 4 occurred because the innovative technologies were integrated into the main construction contracts and could not be separated for individual disbursement. As a result, while a significant amount of innovative technology was implemented during the Project, no additional disbursements were made under this component.

37 Source: PCN (p. 4-6); additional reporting obtained from the PMC and R&BD during the site visit.

38 Source: This conclusion is based on discussions with the R&BD, the PMC, and New Development Bank staff working on the implementation of the second phase of the GRRP.

Table 3: GRRP Results Monitoring Framework - Actual Results[39]

	Baseline 2016	Target Level 2019	Actual 2019	Percentage of Target Achievement
BENEFICIARY INDICATORS:				
1) Total beneficiaries (millions)	0	8	8	100%
2) Villages with new first-level connectivity (number)	0	364	698	192%
3) Villages with new second- and third-level connectivity (number)	0	3,650	5,902	162%
CONSTRUCTION OUTPUT INDICATORS:				
1) New construction of NPRs (km)	0	5,044	4,743.23	94%
2) Resurfacing of NPRs (km)	0	2,518	2,285.63	91%
3) First connectivity of villages (km)	0	593	540	91%
4) Construction of missing link/ structure (number)	0	69	62	90%
5) Approaches to school and colleges (km)	0	2	1.8	90%
6) Construction and maintenance of roads passing through tribal areas (km)	0	233	205	88%
7) PRs - Resurfacing of village and other district roads (km)	0	4,386	3,980	91%
8) PRs - Widening of village and other district roads (km)	0	1,606	1,435	89%
9) Upgradation of metal to black-top surface (km)	0	206	210	102%
10) Upgradation of earth to black-top surface (km)	0	237	165	70%
11) Upgradation existing causeway/ deep to high-level bridge (number)	0	24	10	42%
INDICATOR FOR COMPONENT 3				
Computer system development	0	100%	100%	100%

39 Source: PCN; additional reporting obtained from the PMC and R&BD during the site visit. Percentage of target achievement based on CEIU calculation.

Figure 3: Outcomes of the GRRP as Reported by the Residents of the Villages Visited by the CEIU Team.[40]

Education

Reduced **absenteeism** of students and teachers as access to schools was improved.

Parents use saved travel time to help children with **homework**.

Lower **dropout rates** and more students continuing to **higher education** due to improved access to high schools and colleges.

Health

Improved **emergency and maternal care** due to reduced travel time to hospitals and ambulances reaching the villages.

Less **accidents** due to improved road conditions.

Improved **primary healthcare** such as child vaccinations as health care workers can easier reach the population.

IMPROVED ALL-WEATHER CONNECTIVITY

Social

Improved **safety for women** as they can travel by motorized vehicles instead of walking.

Improved access to religious sites for **worship**.

Reduced **migration** to cities.

Connectivity improves **social relations** with friends and family in other villages.

Economy

Increased agricultural productivity, crop diversification and growing dairy business due to improved access to farmland, to inputs and to markets for selling crops.

New **employment** opportunities in agriculture and nearby factories.

Improved access to **banking services**.

Improved **access to supplies** for stores and **new transport businesses**.

Increased **value of farmland** used as collateral for loans.

40 Source: Discussions with project stakeholders and beneficiaries during the visit of the PLR team.

34. While the Project aimed to improve rural economic development and access to social services through enhanced connectivity, this was not monitored in the RMF. As described in Chapter 2.1, the Project Document lists a set of expected socioeconomic outcomes that were not captured in the RMF and not adequately discussed in the PCN. To estimate the achievement of project outcomes, the CEIU team analyzed secondary data and visited a sample of 13 villages in different parts of the state. The individual villages visited were selected to represent a range of village sizes, locations, and types of investments in rural roads, including first level connectivity, second and third level connectivity, widening and resurfacing, and construction of high-level bridges. An overview of the findings of the CEIU site visits is presented in Figure 3 and a detailed description is provided in Appendix C.

35. CEIU discussions with beneficiaries and project stakeholders suggest that the Project provided all-weather roads that reduce travel time, support the use of motorized vehicles, and enhance passenger safety and comfort. The Project was expected to deliver outcomes by providing all-weather connectivity.[41] Residents in the villages visited confirmed that the improved roads and bridges ensured all-weather access to the villages, including during heavy rain in the monsoon season. However, during the CEIU team's visit, the state experienced unusually heavy rainfall, and some villages became inaccessible. Both villagers and R&BD confirmed that this was exceptional, and the roads and bridges usually ensured access during the monsoon season. As stated in the Project Document, the improved connectivity was expected to reduce travel time, support a change in transport mode from bullock cart to motorized vehicles, reduce vehicle operating costs, and improve passenger safety and comfort.[42] In all the villages visited, a considerable reduction in travel time was reported. Residents used more motorized vehicles and access to public transport increased. The interviewees considered the motorized transport safer and more comfortable, in particular for female travelers. In some villages, the residents reported lower vehicle operating costs due to lower needs for vehicle maintenance.

36. The CEIU data collection along with research by the AIIB Economics Department suggest that the GRRP supported greater economic activity. As stated in the Project Document, the Project was expected to enhance economic development through increased agricultural productivity, industrial development, access to services, and employment generation.[43] Since the start of project implementation in 2017, per capita income in Gujarat grew each year, except for fiscal year 2020-2021, which can be attributed to the coronavirus disease

41 See: Project Document (p. 6)

42 See: Project Document (p. 6)

43 See: Project Document (p. 6)

(COVID-19) pandemic (see Figure 4).[44] The AIIB Economics Department conducted an analysis of the economic development effects of the GRRP using nighttime light intensity as a proxy for economic activity. The research showed that in the post-project period, nighttime light intensity increased by 3.0-8.2 percent in villages that benefited from the GRRP relative to other villages of similar size in the post-project period. This would correspond to an estimated 0.8 percent-2.4 percent increase in local economic output.[45] In all the villages visited, the residents reported that the improved connectivity led to enhanced economic development and access to services such as banking. Along with agricultural productivity improvements (see Figure 5), residents reported that the roads facilitated employment opportunities in nearby factories and allowed women to travel safely to work. Furthermore, in some villages, residents reported that stores in the villages had easier access to supplies and that new transport businesses had emerged. Following construction of a new bridge, one village in which a temple was located became a tourist destination.

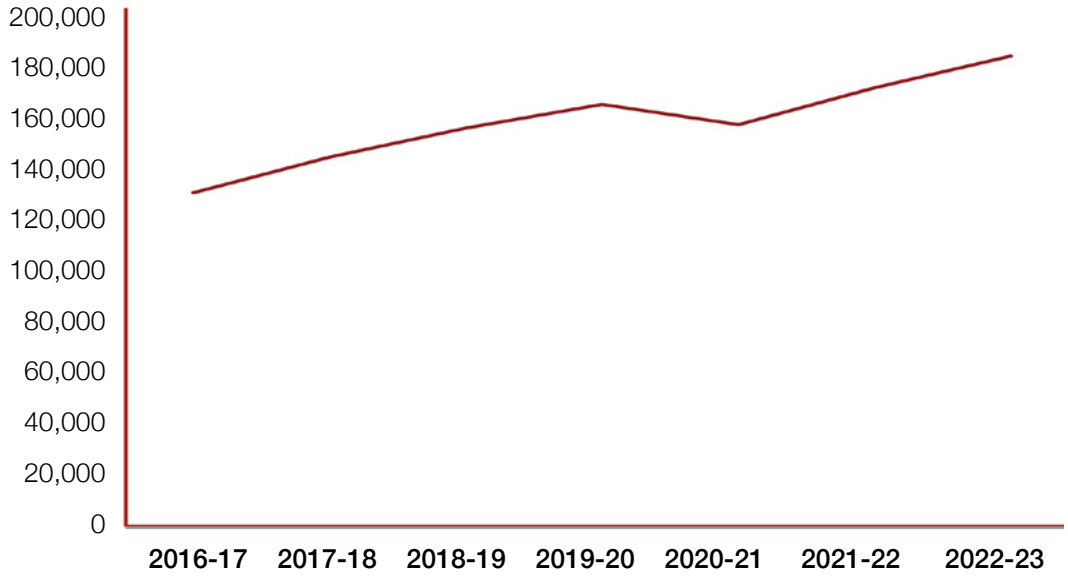
37. The interviews with beneficiaries suggest that in the visited villages the GRRP helped to increase agricultural production, the main economic activity in rural Gujarat. The main agricultural activities in Gujarat are groundnut, cotton, and dairy production. The state ranks first in India for groundnut production, second for cotton production, and fourth for milk production. Since the start of the GRRP in 2017, the production of milk, foodgrains, cotton, and oilseeds in Gujarat all increased, as shown in Figure 5.[46] The primary economic activity in all the villages visited by CEIU was agriculture. The interviewed farmers consistently indicated that the improved connectivity increased their productivity. In addition to improved access to their farmlands, several farmers indicated that they were able to diversify their cropping patterns to include higher value crops such as vegetables, fruit, and horticulture. These crops required ready access to markets to retain their value and the improved road connections helped ensure this. It also became easier for farmers to acquire inputs. Moreover, more buyers visited farms due to easier and cheaper access, which resulted in better prices for farmers. In some cases, farmers indicated that the enhanced accessibility increased their land values, which they were able to use as collateral to obtain loans to acquire seeds and fertilizers. In some villages,

44 See: *Statistical Overview of Gujarat State 2021 & Statistical Overview of Gujarat State 2023.* Directorate of Economics and Statistics. Government of Gujarat. Gandhinagar.

45 See: AIIB Economics Working Paper No. 11 -Transport Infrastructure and Local Economy: Evidence from the Gujarat Rural Roads Project. The researchers use a Difference-in-Difference design comparing villages that were part of GRRP and those that were not treated. The authors employ nighttime light intensity as a proxy for economic activity, which is well-established in economic research literature. Based on annual and long-term growth rate comparisons for a sample of 188 economies, Henderson, Storeygard, and Weil (2012) argue for an elasticity of gross domestic product (GDP) growth to light intensity growth of 0.3. Beyer et al. (2018) estimate this elasticity to be 0.25 for South Asian economies.

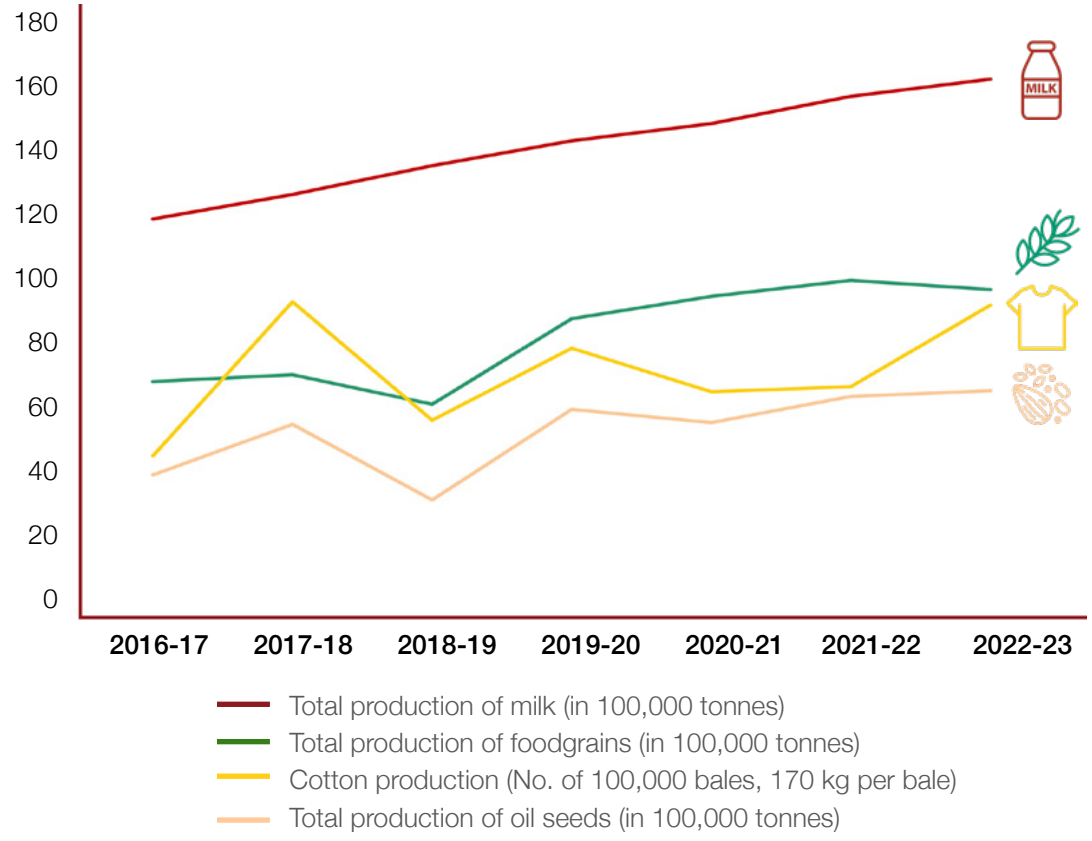
46 See: *Statistical Overview of Gujarat State 2021 & Statistical Overview of Gujarat State 2023.* Directorate of Economics and Statistics. Government of Gujarat. Gandhinagar.

Figure 4: Per Capita Income in the State of Gujarat (in INR, in 2011-12 constant prices)



Source: Statistical Overview of Gujarat State 2021, Statistical Overview of Gujarat State 2023. Dirctorate of Economics and Statistics. Government of Gujarat. Gandhinagar.

Figure 5: Agricultural Production in Gujarat.



Source: Statistical Overview of Gujarat State 2021, Statistical Overview of Gujarat State 2023. Dirctorate of Economics and Statistics. Government of Gujarat. Gandhinagar.

residents reported that the enhanced connectivity allowed them to start or expand dairy businesses as they were now connected to dairy cooperatives.

38. The interviews with beneficiaries and project stakeholders indicate that the GRRP improved access to health care. As described in the Project Document, the Project was expected to lead to better health care and more health care centers established.[47] In all villages visited, the residents reported that their travel time to the nearest hospital has been considerably reduced, with an average of 30-45 minutes reduction reported (see Table 4). Furthermore, the villages are now served by ambulances, which strongly supports access to emergency and maternal care. The accessibility by ambulance was highlighted by the Implementing Agency and the PMC as a major benefit of the Project. In some areas the improved connectivity enabled health workers to reach the population in surrounding smaller settlements to provide services such as child vaccinations and increased their use of primary health care facilities in the villages. While in one village the residents reported that the primary health care facility was enlarged after the road was built, the CEIU team did not find evidence for more health care centers established.

Table 4: Travel Time to Health Facilities for Selected Visited Villages.

Village	Before	After
Anindra	2.5-hour journey to the nearest hospital	Reduced to 30 minutes
Rampara	Over one hour to reach the nearest hospital	Reduced to 20 minutes
Mulada	Up to two hours to reach the nearest hospital	Reduced to 30 minutes
Dasaj	Up to three hours to reach the main district hospital	Reduced to 35 minutes

39. The interviews with beneficiaries and project stakeholders also suggest that the GRRP improved access to education. The Project Document states that the Project was expected to increase literacy through better access to schools and more schools being built.[48] In all villages visited, teachers reported that the improved connectivity led to a decreased dropout rate and less absenteeism among both students and teachers, particularly during monsoon season. Female teachers highlighted that it was easier and safer for young girls to walk to school along roads that were well-used and open to view. While CEIU did not find evidence for new schools being built, school enrollment numbers increased in many villages.

47 See: Project Document (p. 6)

48 See: Project Document (p. 6)

Furthermore, access to nearby high schools became easier, leading to a decreased school dropout rate after primary education, with more students able to continue to higher education.

40. In addition to the expected outcomes detailed in the Project Document, beneficiary communities also underlined the importance of improved social connectivity that resulted from the GRRP. The connectivity improvements were associated with improved social activities within and between villages. Enhanced connectivity with nearby villages enabled residents to visit friends and family, attend religious ceremonies, and participate in cultural activities. Residents also emphasized that travel became safer for women, as they were able to use motorized vehicles. Some villages and the Implementing Agency also reported that the GRRP had contributed to reduced migration from the villages to cities. As travel to larger cities became easier, more villagers were able to stay in their village while commuting for employment to the cities. This supports social cohesion in the villages and eases migratory pressures in the cities.

41. The safety of the roads is adequate considering the rural context, but more safety measures could have been included. As indicated in the Project Document, the GRRP was expected to contribute to passenger safety.[49] Road safety is an important health-related concern in India, as statistically, one death on Indian roads occurs every five minutes.[50] Community consultations in the villages indicated that residents generally considered the rural roads to be safe. In some villages, health workers reported that the number of road accidents had decreased as it was safer to travel by motorbike on an asphalt road rather than an earth road. The Implementing Agency and a national nongovernment organization working on road safety indicated that rural road safety was a relatively minor concern compared to safety issues on highways. While safety audit guidelines from the Indian Roads Congress were followed during the design, construction, and post-construction phases, it was noted that rural roads often lacked systematic safety audits, which can contribute to safety hazards.

42. An important addition to the Project was the inclusion of E&S safeguard analysis. Under Government of India regulations, an E&S safeguard analysis is not a requirement for rural road improvements, and it was not incorporated into the original project conceived by R&BD. The Government of Gujarat nevertheless agreed to incorporate such a component to comply with AIIB requirements. AIIB ensured the Project met its E&S requirements. During appraisal, AIIB reviewed key E&S documents, including the ESIA and ESMP, aligning them with its ESF and identifying

49 See: Project Document (p. 6)

50 See: Road safety (who.int)

risks early. Consultants were engaged to conduct E&S analyses for each of the roads constructed or improved under the project. However, there was a considerable delay in the engagement of the consultants and work did not commence until 9 months after loan approval. Since a high proportion of the roads had already been constructed or were under construction by the time of their engagement, the consultants retroactively examined each of the roads together with R&BD staff to ensure that each road met the E&S requirements.

43. Overall, the PLR rates the Project as *"Effective."* The Project achieved 95 percent of its physical construction targets, with over 13,580 km of rural roads constructed or upgraded. The GRRP exceeded its target of providing all-weather road connectivity to 4,000 villages, ultimately covering around 6,600 villages. This improved connectivity benefited an estimated eight million people, successfully meeting the Project's objectives. However, the effectiveness was somewhat diminished by the partial delivery of the TA and institutional strengthening component, as well as the non-implementation of the innovative technology component. Despite these limitations, the Project is likely to have contributed to the intended socioeconomic outcomes. CEIU's field-based assessment suggests that the Project facilitated economic development, improved agricultural productivity, enhanced access to healthcare and education, and strengthened social connectivity in the visited villages. Secondary research data assessing nighttime light intensity also suggest that the Project contributed to economic development. AIIB's inclusion of E&S safeguards further enhanced the Project's overall impact, though it should be noted that some E&S assessments were conducted retroactively.

EFFICIENCY

44. An economic analysis of the GRRP was carried out at appraisal to assess its economic viability. The cost-benefit analysis considered capital and maintenance costs against benefits such as savings in vehicle operating costs, passenger time savings, and increases in agricultural production. The EIRR of the Project was calculated by comparing the economic costs and benefits over 22 years, including two years of construction and 20 years of operation. At appraisal, the EIRR was calculated at 15.8 percent, with 14.1 percent for NPRs and 18.4 percent for PRs. The lower EIRR for NPRs was attributed to lower traffic volumes. The EIRR at appraisal exceeded the recommended opportunity cost of capital of 12 percent. Unlike most other IFI-supported rural road projects in India, the GRRP analysis assumed that the investment would increase agricultural production, attributing 24 percent of the benefits to this factor. This assumption contributed strongly to the overall positive economic return of the Project. At the same time, the cost-benefit analysis did not capture a range of project outcomes, such as increased

employment, improved access to healthcare and education, and strengthened social connectivity.

45. The Project was implemented according to its original timeline with some minor delays and realized savings of 38 percent of the original estimated costs (see Table 5). The Project was implemented according to its timeline with some relatively minor delays affecting 810 km of road works due to a heavier and longer monsoon season. According to the Implementing Agency, the large reduction in project construction costs was attributable to the competitive nature of the bidding by local contractors. The bidding process used the Government's e-procurement process, which is the standard form of bidding for rural road projects, and a primary aim was to attract small local firms to bid for construction contracts.[51] Furthermore, cost estimates for construction in all sectors in Gujarat are based on state-approved

Table 5: Estimated and Actual Costs of the GRRP.[52]

Project components	Cost in USD million				
	AIIB	Share	Client	Share	Total
COMPONENT 1					
At appraisal:	203.00	49.5%	207.00	50.5%	410.00
Actual:	203.07	81.6%	45.91	18.4%	248.98
COMPONENT 2					
At appraisal:	120.00	49.5%	122.00	50.5%	242.00
Actual:	124.75	81.6%	28.20	18.4%	152.95
COMPONENT 3					
At appraisal:	3.0	100%	0	0%	3.00
Actual:	0.36	81.6%	0.08	18.4%	0.44
COMPONENT 4					
At appraisal:	2.18	100%	0.00	0%	2.18
Actual:	0.00	0%	0.00	0%	0.00
Front-End Fees:	0.00	0%	0.82	100%	0.82
Total Estimated Costs:	329.00	50%	329.00	50%	658.00
Total Actual Cost:	329.00	81.6%	74.19	18.4%	403.19

51 This process was similar to the bidding processes used under the earlier PGMSY programs.

52 See: PCN (p. 4)

prices for construction materials rather than market prices, providing potentially inflated estimates. In November 2017, a sample of 40 contracts was selected for assessment of procurement processes. The evaluation shows that bid prices of these contracts were below price estimates by approximately 22 percent, with every single contract below the engineer's estimate. In retrospect, given that about 1,000 contract packages had already been awarded by the time of appraisal, more accurate costs should have been estimated and adjustments made to either reduce the size of the loan or increase the length of roads to reflect the loan amount.[53]

46. The disbursement estimates included maintenance provisions and general services tax, which did not meet AIIB's loan conditions, resulting in some funds remaining unused. Each of the construction contracts included an element for future road maintenance, which totaled 2.5 percent of the construction costs. This element was deducted from the construction cost payments at source and was to be used post-project completion for maintaining the road over a three-to-five-year period.[54] In addition, each of the contracts was subject to general services taxes which were ineligible for disbursement. Furthermore, Component 4 on innovative technology was canceled and under Component 3 only USD0.44 million of the allocated USD3.0 million was disbursed due to inadequate time to arrange training and learning activities.

47. It was not possible to use the undisbursed funds for other activities due to the limited flexibility in the Project's scope and implementation period. The likelihood of a significant cost underrun was recognized by the AIIB Project Team during implementation in 2018, and discussions were held with R&BD on how cost savings could be utilized. At the time, it was agreed that funds could potentially be used to improve the road safety elements of the engineering designs and to provide village street lighting. However, the Implementing Agency and the Borrower could not arrive at a decision in a timely manner and the recommended solutions were not adopted. As the Government of India generally does not grant extensions for loan closing dates, it was not possible to implement recommended solutions during the Project's timeframe. The experience highlights the importance of assessing project costs accurately and building in the flexibility that may have enabled the Project's scope to be adjusted.

48. The EIRR was not re-estimated at completion. As a result, the PCN did not incorporate an economic analysis for the completed project.[55] While this is standard practice at AIIB, the absence of an ex-post EIRR inhibits a comprehensive

53 See: Project Document (p. 16)

54 The length of the maintenance period depended on the type of road works with three years being the norm for rehabilitation works and five years for new road construction and upgrading works.

55 See: PCN (p. 4)

assessment of efficiency. Given the importance of the EIRR to determine the efficiency of projects, the re-estimation of the economic analysis should be a standard requirement for project completion.

49. Since updated traffic and vehicle operating cost savings were not available for the PLR, it was not possible to re-estimate the EIRR of the completed project. A comparison of the traffic growth rates used at appraisal with actual figures quoted in the PCN at completion indicates that traffic growth on the NPRs was similar to the appraisal estimates averaging about 10 percent a year, while growth rates on the PRs increased to about 16 percent a year. This high growth is in line with Gujarat's increase in GDP of between 13 percent and 17 percent over the 2021 to 2023 period. This suggests that the traffic estimates used in the appraisal are likely to be conservative. A re-estimate of the appraisal analysis using the actual lower construction costs results in an upward revision of the EIRR to 22.8 percent. If a similar scenario as used by other MDBs that do not incorporate agricultural benefits is adopted, the revised EIRR would reduce to 14.8 percent. At this level, the EIRR would still exceed the AIIB's minimum discount rate of 12 percent applied at the time of appraisal.

50. Despite an overall high degree of efficiency, the large number of contracts was a strain on resources. Awarding, managing, and monitoring over 1,600 contract packages was a challenge for efficient project implementation. The Project could have benefited from "right sizing" to larger civil works packages to ease the administrative burden while maintaining adequate levels of competition. The World Bank and the Asian Development Bank usually require individual roads to be grouped into larger bid lots, which typically results in around 60-79 contract packages per Indian state. Fewer packages are considered to ease project management and better manage the risk of corruption. However, the client highlighted that the larger number of packages enabled the involvement of many local contractors, thereby helping build local capacity.

51. Overall, the PLR rates the Project as *"Efficient."* The Project demonstrated strong economic returns, cost savings, and timely implementation. The Project likely exceeded its intended EIRR, which was re-estimated by CEIU at 22.8 percent when accounting for agricultural productivity gains, or 14.8 percent excluding these gains, as typically done by other MDBs. The Project was largely implemented on schedule, with only minor delays due to an extended monsoon season. A main factor driving efficiency was the 38 percent reduction in actual costs compared to estimates. While these cost savings highlight the Project's efficiency, identifying them earlier could have enabled better use of the funds for additional enhancements, such as road safety improvements or village street lighting—a missed opportunity. Although managing over 1,600 contract packages

posed an administrative challenge, this was well-handled by the Implementing Agency. Nevertheless, grouping contracts into larger packages, as done in World Bank and Asian Development Bank projects, could have further eased this burden.

SUSTAINABILITY

52. Adequate maintenance will be critical for the long-term sustainability of the rural roads. As described in the Project Document, the key to successfully sustaining the benefits of the GRRP is adequate maintenance of the roads.[56] The quality of the road construction and the impact of climate change intensify the need for road maintenance. While the Technical Audits found the roads to be generally constructed in accordance with the specifications and contract criteria, the reports also alluded to some deviations from the expected quality, such as missing drainage structures, (side- and cross-drains) and safety furniture. The Technical Audits observed that distress, cracking, edge breaks and raveling (asphalt breakdown) were visible on some completed road pavements, which was confirmed during the ELA team field visit. This indicates that the road quality is generally not high, making it likely that most roads have a need for more maintenance. In addition, the impact of climate change may cause higher need for maintenance and resurfacing in the future as heavy rainfall will intensify.

53. The financial provisions are likely to be sufficient for road maintenance. Each contract incorporated a defects liability period (DLP) of three to five years depending on the type of work. Under the contracts, the contractors forfeit their retention payments if any faults reported by the R&BD are not rectified within a certain period. This ensured that resources were available post construction for routine maintenance of the infrastructure. The Implementing Agency indicated that it has sufficient funds to maintain the roads beyond the defect's liability period. It also indicated that allocations for improving and maintaining the rural road network was a continuous program that involved both external and domestic resource mobilization. While the Project covered almost 14,000 km of rural roads, this represents only about 13 percent of Gujarat's rural road network. Within the state, the upgrading and maintenance of rural roads is a continuous program over a 7-to-10-year period as roads require upgrading as traffic flows increase and resurfacing is required at least once every 10 years. With the rural road network representing about 83 percent of Gujarat's total road length, the annual program is large and increasing as more road links are added to the network each year.[57]

56 See: Project Document (p. 12)

57 Since 1981, the road network of the State has almost tripled from 47,420 km to 131,230 km. The majority of the increase in road network was in the rural road category.

54. R&BD is equipped with strong institutional capacity for ensuring adequate road maintenance. R&BD is a large organization with over 1,400 staff managing over 131,200 km of road network and annual projects totaling about USD1.3 billion. It has a well-established organizational structure. Rural roads are handled by an organizational framework led by the Chief Engineer Panchayat Roads comprising six regional Superintending engineers and 33 Executive Engineers (one in each district) who are supported by a hierarchy of Deputy, Assistant, and Additional engineers down to the *Taluka* (block) level. The annual budget for rural roads exceeds USD500 million a year and R&BD has adequate capacity to manage the large and expanding network of rural roads.

55. The roads and bridges visited by CEIU were in adequate condition, indicating a continual process of road maintenance. During the site visit, the CEIU team inspected 12 roads and two bridges that were constructed under the GRRP. The team noted that the assets were in adequate condition given that they were already in use for some four to six years. The R&BD district engineers indicated that they regularly maintain the roads and solve small issues such as potholes and cracks after the monsoon season. In all villages visited, the residents expressed satisfaction with the way the roads are maintained by R&BD, indicating that after each monsoon season, issues are solved and that they can easily reach out to R&BD if maintenance is required. The roads visited did not show signs of major cracks and potholes, confirming the continuous process of maintenance. Several roads visited showed signs of need for resurfacing, which according to R&BD was already scheduled for the coming year. See Appendix C for a detailed description of the roads and bridges visited. The need and demand for improved rural roads in Gujarat is high, and a new rural roads program was recently approved by the New Development Bank to support a further phase of its development.[58]

56. Community feedback in the villages suggests that the Project's socioeconomic benefits are likely to have been sustained. Residents of the 13 villages visited reported numerous positive outcomes resulting from improved connectivity. Notably, the CEIU team visited these villages four to six years after the road works were completed, yet the reported benefits have remained consistent, indicating long-term sustainability.

57. The Project posed significant but manageable E&S risks that were effectively mitigated during implementation. The GRRP was assigned Category "B" under AIIB's ESF.[59] The Project posed significant but manageable environmental and social risks, which were site-specific and reversible. Environmental risks included

58 See: Gujarat Rural Road Program - New Development Bank (ndb.int)

59 See: AIIB Environmental and Social Framework ESF June 2024

soil erosion, habitat disruption, and localized air pollution during construction. Social risks primarily involved minor land acquisition that affected communities particularly in tribal areas. While retroactive financing accelerated the Project, it presented risks, such as construction commencing before safeguards were in place. These risks were mitigated by pre-screening eligible activities to ensure compliance with safeguard measures. The ESMF was prepared by E&S consultants in advance of the loan approval. For the preparation of the ESMF, all villages concerned by the Project were visited. The engagement of the E&S consultants took time to complete, and they only started working on the ground nine months after loan approval, by which time a high proportion of the civil works had been completed. As a result, many of the roads were assessed for E&S compliance retroactively. Reporting was done quarterly starting in mid-2018. The final compliance report of the consultant was delayed and was only made available in June 2020.

58. A GRM was put in place for each cluster of subprojects, but community concerns were mostly addressed through the Local Self Government. An AIIB supervision visit in July 2019 found the GRM at a project site to be dysfunctional. Instead, community concerns were mostly addressed through the Local Self Government, which is a natural platform for grievance redress at the village level. This practice was similar to the practices under PMGSY and how the World Bank Rural Roads II Project anticipated handling complaints. The reported concerns were of low magnitude (such as regarding the place of unloading of construction materials, removal of construction debris, etc.) which could be addressed with immediate effect with the help of the Village Head *(Sarpanch)*. During implementation there were no grievances received by the GRMs.

59. The project was subject to allegations of wage payment irregularity and sexual harassment by a Delhi-based Civil Society Organization (CSO).[60] The CSO produced a case study on gender in the GRRP, claiming that it found widespread labor rights violations at the project work site and across the supply chain, including long work hours, pay below minimum wage, use of threats, and work in pitiful conditions. However, the Project Team stated that no evidence was presented by the CSO to support this claim. The matter was investigated by a Joint Mission of AIIB and R&BD, which found no evidence of instances of sexual harassment or irregularity in payment of wages. The AIIB GRRP safeguards staff subsequently trained two female engineers from R&BD and one female staffer from the E&S consultancy to interview women on-site about the incident. Discussions with female-only groups were held to figure out if there were any incidents of sexual harassments. These female interviewers reported that the female interviewees had no knowledge of the original complaint. The findings of the investigation were reported

60 See: PWESCR - Programme on Women's Economic Social and Cultural Rights

to AIIB Management and communicated to a representative of the CSO in a face-to-face meeting. No complaint was brought to the AIIB's Project-affected People's Mechanism.

60. Overall, the PLR rates the Project *"Likely Sustainable."* The Implementing Agency, R&BD, demonstrated its capacity to manage and maintain the rural road network effectively. With over 1,400 staff and a well-established organizational structure, R&BD has both the human and financial resources necessary to ensure the continued upkeep of the infrastructure. The inclusion of a defect's liability period in contracts, along with the state's commitment to providing adequate funding for routine and ongoing maintenance, further supports the Project's sustainability. Although the quality of rural roads is not exceptionally high, field observations indicated that four to six years after construction, the roads remained in reasonable operating condition. R&BD also reported that several roads are programmed for overlays as their pavements approach the seven-year design life. The continuous road upgrading and resurfacing program, combined with positive feedback from local communities on maintenance, underscores the Project's likely long-term viability. From an E&S perspective, the Project successfully mitigated key risks related to soil erosion, habitat disruption, and minor land acquisition, ensuring these impacts were site-specific and reversible. There were some delays in environmental assessments and a few technical issues, such as missing drainage structures. The overall design partially incorporated climate change considerations, broadly enhancing the infrastructure's resilience to extreme weather events but lacking specific considerations.

Work Quality Assessment

AIIB WORK QUALITY

61. AIIB adopted a flexible approach to supporting the already well-advanced Project, which the Implementing Agency perceived as a distinctive advantage of working with AIIB. AIIB was introduced to the Project late in its development, after the concept and scope had been fully prepared by the Implementing Agency using its own resources. The fact that implementation of the Project had already commenced created a situation where there was limited room to adjust its scope or change implementation arrangements. Prior to AIIB involvement, the scope had been defined and decisions had been made to implement the Project through multiple small contracts using locally based contractors. Bidding using an e-procurement process was largely complete and more than 1,000 contract packages had been awarded. AIIB adopted a proactive approach to project preparation and quickly fielded several missions to review various aspects of the Project and ensure that it reflected AIIB's technical requirements, policies, and safeguards. The Implementing Agency highlighted that staff listened to and noted the client's needs and provided responsive comments and suggestions. In particular, AIIB was flexible with respect to the use of country bidding documents and national procurement processes used under MMGSY once it found the processes to be adequate. Both the Implementing Agency and PMC indicated that they highly valued the AIIB's flexible and adaptive approach and perceived this as a distinctive advantage of working with AIIB.

62. While AIIB's review at the appraisal stage encompassed all aspects of the Project, there appear to be some areas where the Project would have benefited from a more in-depth review. The large cost underrun could have been averted if greater attention had been paid to accurately assessing project costs. Since a high proportion of the contracts had already been awarded, there was clear evidence that many bids were below the estimated costs. Similarly, a more in-depth preparation of the capacity building program and the innovative technologies component would have helped ensure that the resources allocated for them were effectively used. The project preparation would have benefited from more time and more allocation of technical sector expertise.

63. AIIB ensured the project met its E&S requirements. During appraisal, AIIB reviewed key E&S documents, including the ESIA and ESMP, aligning them with its ESF and identifying risks early. To address the retroactive financing component, AIIB brought in a senior environmental consultant for additional oversight. There were, however, opportunities to enhance supervision during implementation. While essential documents such as the E&S Due Diligence (February 2016), E&S Impact Assessment, and Tribal Population Planning Framework were well-managed, a more consistent review of monitoring reports could have provided better ongoing guidance and ensured stronger compliance with E&S standards. AIIB's requirement for

comprehensive public consultation and due diligence also contributed to community engagement and support. Overall, AIIB's approach to managing E&S safeguards was adequate, with early risk identification and effective consultation processes. Stronger monitoring during implementation could have further supported the project's outcomes and sustainability.

64. Even though the Project duration was only two years, there were frequent changes in AIIB staff during implementation. During implementation there was also a shortage of technical sector expertise, which resulted in review missions and Project supervision largely focused on the process rather than on the technical aspects of the project.[61] Due to staff turnover within AIIB and various reorganizations carried out within the growing and evolving Bank, the Project experienced frequent changes in staff, including three different Project Team Leaders and various changes in other functions. These changes in staff during implementation were compounded by the lack of a comprehensive knowledge management, which undermined the effectiveness of Project monitoring and supervision. For example, while the RMF included semi-annual and quarterly indicators, they were not consistently monitored during implementation. The high staff turnover and lack of structured knowledge management and data archiving became particularly evident when the CEIU team requested project documents, which had to be collected from several different sources and remained incomplete. For example, the final list of roads and bridges constructed under the GRRP could not be identified by any member of the AIIB Project Team and had to be requested from the PMC consultants.

65. AIIB's assessments at project closure captured Project success only to a limited extent. The Project Team provided its final assessment in the PCN. The PCN remained largely a narrative document, without a comprehensive analytical assessment of project success. The PCN misreported the number of beneficiaries, and the consideration of project efficiency was limited, with no recalculation of the EIRR provided. Contrary to standard practices in other MDBs, the PCN did not provide a rating of core project aspects, except for assessing it as likely sustainable. This insufficient assessment limits AIIB's ability to learn from past experiences and to comprehensively assess its project success.

66. Monitoring the large number of civil works across Gujarat without a local presence was challenging for AIIB. AIIB does not have a local presence in India and the Project did not have an independent supervision consultant overseeing construction under the Project. AIIB had to rely on R&BD staff for information as

61 It is noted that a Senior Transport Expert (consultant) was retained to support several of the preparation and review missions undertaken by the AIIB. However, over the implementation period there were substantial changes in the Project Team including three project team leaders, four financial management staff including consultants, and three procurement specialists.

well as the digital RPMS. The RPMS became a key source of information but only operated partially as it required manual contract information inputs at the local level.[62] The Implementing Agency suggested that the Project would have benefited from an AIIB representative or AIIB-appointed consultant in Gandhinagar.

67. AIIB recognized the challenges of monitoring the large scope of civil works scattered across Gujarat. AIIB recognized the challenges of effectively monitoring the large-scale civil works spread across Gujarat. To address this, AIIB recruited a Technical Audit consultant using its own resources to provide an independent assessment of the quality and outcomes of the construction contracts. The main benefit of the Technical Audits was that they assured AIIB that the civil works were executed according to design requirements and contractual obligations, while also identifying areas where construction quality and road safety could be improved. However, despite these Technical Audits, both the PCN and the interviewed Technical Audit team indicated that their findings largely did not influence the project outputs. This was likely due to the lack of sufficient time to fully integrate the audit results into the project cycle. Had more time been allocated to understanding the project requirements during planning, additional resources for construction supervision could have been incorporated into the original project scope, thereby enhancing the practical use of findings to improve road quality and safety. This highlights the need for better planning and resource allocation for future projects.

68. AIIB worked closely with R&BD and established a good working relationship with the implementing agency. AIIB responsiveness was high and good teamwork enabled the Project to be prepared quickly, which was particularly important given that implementation was already underway. The Implementing Agency appreciated AIIB's adequate and timely support to R&BD and the PMC throughout project implementation from appraisal to loan closing. AIIB provided support in financial management by guiding R&BD staff and consultants through the withdrawal application preparations; preparation of terms of reference for external auditors; and amendments to the loan agreement. According to the client, AIIB was easily accessible for services or support throughout project implementation and communication through different channels worked well. However, there was limited contact with the Implementing Agency post-project closure and the second phase of the GRRP will be supported by the New Development Bank. A greater local presence of the AIIB could have fostered a continuous relationship between the Implementing Agency and AIIB extending beyond project-closure.

62 Discussions with the New Development Bank which is implementing a follow-on rural roads project in Gujarat indicated that the model is undergoing significant upgrading to eliminate many of the manual processes to increase efficiency and make it a useful project management tool.

69. The PLR rates AIIB Work Quality as *"Satisfactory."* AIIB demonstrated flexibility after engaging in the Project at a late stage and established a strong working relationship with the Implementing Agency. AIIB provided support in financial management, project oversight, and E&S compliance. However, several challenges arose during project implementation, including high staff turnover at AIIB, the absence of a local presence, and the complexity of monitoring numerous contract packages spread across Gujarat. These factors complicated effective project supervision. To mitigate these risks, AIIB engaged Technical Audit consultants for independent oversight of the quality and outcomes of the construction contracts. This proactive approach ensured that civil works adhered to design standards, even without an on-site independent supervision consultant. Given that this was AIIB's first stand-alone operation in the rural road sector, the institutional performance risks were heightened due to limited experience in project formulation and implementation. While there were some shortcomings in AIIB's Work Quality, such as gaps in knowledge management, these challenges were not unexpected for a new and expanding institution. A greater local presence by the Bank could have fostered a stronger working relationship between the Implementing Agency and the Bank that would have persevered post-project closure.

CLIENT WORK QUALITY

70. Despite AIIB's late engagement, the Borrower and the Implementing Agency worked to ensure that the Project complied with AIIB's standards. Despite the advanced nature of the Project prior to AIIB's involvement, the Borrower and the Implementing Agency worked to ensure that the Project met AIIB standards in terms of alignment with its policies and safeguard provisions. Various components of the project were adjusted to accommodate AIIB's requirements, most notably the inclusion of E&S assessments, which are not required for rural road projects under current Indian government regulations.

71. R&BD demonstrated substantial capacity to design and develop rural road programs. R&BD had previous experience with the government funded PGMSY program. The main parameters of this program formed the backbone of the ensuing MMGSY program. Thus, R&BD was closely familiar with the requirements relating to engineering designs, contracting processes, and management and oversight of many contractors. The project scope was well-defined, and R&BD had developed and applied a rigorous methodology in prioritizing and selecting the roads and bridges to be covered under the Project.[63]

63 See: Project Document (p. 18)

72. R&BD's high capacity was also evident during the implementation stage of the project. During implementation, R&BD demonstrated strong capacity to manage a large number of small road works spread across the state. During the Project, R&BD managed 1,615 contract packages covering 4,692 civil works comprising 4,620 roads and 72 bridges. At project closure, 13,580 km of roads (91 percent of the total) had been completed, with another 810 km (five percent of the total) ongoing that was subsequently completed using government funds. The commitment of R&BD during the entire period was instrumental for the smooth implementation of the project. The high level of engagement as well as the continuous professional interaction between R&BD's top-level management and staff and the AIIB team brought the project to full, timely, and orderly completion.

73. With the support of E&S consultants, R&BD effectively managed E&S risks throughout the Project. The consultants prepared comprehensive E&S studies, including the ESIA, ESMP, RAP, and IPP, ensuring that the Project was well-aligned with AIIB's standards. R&BD demonstrated responsiveness in implementing these plans and addressing community concerns through the GRM, which was a critical component in maintaining transparency and building trust with affected populations. However, at closing, the Project's semi-annual ESMP compliance report had been outstanding for more than six months. R&BD had also not made arrangements to prepare the project completion report to document the Project's ESMF Compliance, which was a requirement to close the Project. Delays in consultant contracting appear to have affected the timely delivery of monitoring reports. This resulted in a red flag for delayed submission of the ESMP safeguard compliance report by several months. While the external consultants provided high-quality technical expertise on E&S issues, R&BD's reliance on external consultants exposed the project to potential risks in terms of long-term sustainability. Building in-house expertise on E&S issues would reduce dependency on external consultants and ensure that R&BD is well-equipped to manage future infrastructure projects independently.

74. To further enhance its work quality, R&BD could strengthen its in-house capacity for technical quality assurance, contract management, and finance and accounts. Despite the three-level Quality Monitoring System, there was a repetitive weakness in attention to construction of road shoulders in some of the civil works. Once R&BD became aware of the issue, it was communicated to the contractor for correction. Strengthening its quality assurance and contract management capacity would enable R&BD to deal with contractual issues at earlier stages of implementation for proper and timely corrective action. For projects of similar size, R&BD could work on strengthening its accounting practices and systems by adopting double entry bookkeeping and using IT in planning, accounting, and reporting. Considering some internal control weaknesses noted in this Project,

strengthening internal control procedures and using internal audit for periodic review could support timely corrective actions.

75. Overall, the PLR rates Client Work Quality as *"Highly Satisfactory."* This rating is supported by the exceptional performance of both the Borrower and the Implementing Agency throughout the GRRP. Despite the Project being well-advanced before AIIB's involvement, the R&BD demonstrated a high degree of engagement and adaptability to ensure the Project's alignment with AIIB's policies, particularly regarding E&S safeguards. R&BD's experience in rural road program development, particularly from the government funded PMGSY program, was critical in its effective management of the GRRP. The Implementing Agency successfully handled 1,615 contract packages across 4,682 civil works, including roads and bridges. By project closure, 95 percent of the total works were completed, with the remaining five percent finalized using government resources. This achievement reflects R&BD's strong project management and oversight capacity. Continuous cooperation, professional interaction, and high-level engagement between R&BD and AIIB were instrumental in ensuring the Project was completed on time and in an orderly manner. Additionally, with the support of E&S consultants, R&BD managed E&S risks effectively throughout the Project. While there were some delays in E&S compliance reporting and consultant contracting, these did not strongly impact the overall success of the Project. Strengthening in-house E&S expertise and further building internal capacity for quality assurance and contract management would enhance R&BD's performance even more.

Conclusions

OVERALL ASSESSMENT

76. Overall, the PLR rates the Project as *"Successful."* The GRRP was **Relevant**, addressing critical rural connectivity needs in Gujarat while aligning with both national and state priorities and AIIB's strategic focus on infrastructure development. The Project was **Effective**, exceeding its targets for village connectivity and benefiting approximately eight million people. Although the ability to capture broader outcomes was limited by the absence of a robust RMF, CEIU's visits to 13 villages confirmed socioeconomic benefits, such as improved access to markets, healthcare, education, and enhanced agricultural productivity, for the visited villages. The Project demonstrated **Efficiency** through adequate economic returns, cost savings, and timely implementation. The **Likely Sustainability** of its outcomes is supported by the institutional and financial capacity of the R&BD to maintain the road network. **AIIB's Work Quality** was rated **Satisfactory**, reflecting its responsive and flexible approach, although challenges related to staff turnover and monitoring were noted. The **Client's Work Quality** was rated **Highly Satisfactory**, with R&BD showing exceptional project management and effective handling of environmental and social risks. In conclusion, the GRRP is overall rated **Successful**. The PCN did not provide ratings of the project performance, which was not required as per the guidance for PCN at the time of PCN preparation. Therefore, Table 6 presents only the assessment of project performance from the PLR.

Table 6: Overall Assessment of Project Performance

Evaluation Criteria	Project Learning Review
Relevance	Relevant
Effectiveness	Effective
Efficiency	Efficient
Sustainability	Likely sustainable
Overall Assessment	**Successful**
AIIB Work Quality	Satisfactory
Client Work Quality	Highly satisfactory

ISSUES

77. Notwithstanding the overall success of the Project, the PLR identified three main issues that affected the GRRP. These are:

78. Issue 1: A significant difference between appraisal and actual project costs. The Project experienced lower-than-expected expenditure, with disbursements amounting to over 38 percent less than the original estimated costs, largely attributed to competitive bidding and inflated government estimates of unit prices. However, the substantial cost underrun could have been mitigated through a more detailed review during the appraisal stage, particularly since a high proportion of contracts had already been awarded before project approval. Furthermore, the limited flexibility in adjusting the Project's scope and implementation timeline implied that the loan savings could not be redirected toward additional road works or improvements in road safety elements. Earlier recognition of the cost underrun and more timely engagement with the Borrower and Implementing Agency could have facilitated the reallocation of funds to enhance project outcomes.

79. Issue 2: Limited monitoring of outcomes and efficiency measurement. In the context of an early stage of AIIB operations with limited guidance on results measurement, the RMF primarily focused on tracking physical outputs but did not adequately measure the expected socioeconomic outcomes of the Project. This lack of outcome-oriented monitoring limited AIIB's ability to fully assess the Project's effectiveness and the realization of its intended benefits. Additionally, extending monitoring beyond project closure could help identify medium- to long-term benefits and enhance accountability. Furthermore, the absence of a recalculated EIRR at project completion constrained the assessment of project efficiency. Recalculating the EIRR upon project completion, a standard practice among MDBs, would offer a more comprehensive insight into the project's overall efficiency and return on investment.

80. Issue 3: Shortcomings in implementation arrangements and internal knowledge management. The complexity of the GRRP, coupled with the lack of a local AIIB office and a dedicated supervision consultant, posed challenges for project monitoring and knowledge management. The project's extensive scope, involving over 1,600 small road work contracts across Gujarat, required robust oversight. Recognizing this need, AIIB engaged a Technical Audit consultant and utilized its own resources to enhance monitoring support. However, ongoing staff transitions and organizational changes within the expanding Bank resulted in multiple shifts in PTLs and team members, impacting the project's continuity and stability, along with inadequate knowledge management systems, exacerbated the oversight challenges. This lack of continuity undermined effective project supervision, revealing gaps in

data management and document archiving. For instance, the final list of constructed roads and bridges was not readily available at AIIB, important project documents had to be sourced from multiple locations, and the PCN provided an incomplete assessment at project closure. A more structured approach to knowledge and document management, coupled with stronger implementation arrangements, would have facilitated more effective oversight and long-term learning from the Project.

LESSONS

81. The PLR identified five lessons from the GRRPs experience. These are:

82. Lesson 1: Prioritizing safeguard implementation and continuous monitoring is important to ensure compliance with AIIB policies and to mitigate risks. Early preparation and implementation of E&S safeguards, such as ESIA and ESMP, is crucial for mitigating risks and supporting sustainability, especially in projects involving retroactive financing. Continuous monitoring through field visits and audits ensures compliance with AIIB's ESP, helping to address risks and align projects with long-term sustainability objectives. Thorough documentation of E&S records is essential for future assessments, fostering accountability and informed decision-making.

83. Lesson 2: Sufficient time for thorough technical due diligence during project appraisal is essential to avoid issues related to cost estimates and loan structuring. Sufficient time for technical due diligence during project appraisal is crucial for avoiding issues related to cost estimates and loan structuring. It is recognized that the Bank does not always have full control over project preparation timelines. However, it is essential that adequate time is available during appraisal to meet the AIIB's processing requirements and ensure that project safeguards and policies are adequately met. If timelines are too short, discussions with the proposed client are required to suitably adjust the appraisal preparation timeline to provide adequate inputs to prepare the project. For short-duration projects, the early identification and implementation of components, such as training activities, are vital, as limited resources and dense schedules can impede effective capacity development initiatives. Thorough preparation allows for smoother execution and helps minimize cost overruns. Additionally, allocating adequate technical sector expertise to Project Teams should be standard practice to ensure quality project delivery and provide necessary oversight during implementation.

84. Lesson 3: A high capacity implementing agency and flexible AIIB support can effectively support successful outcomes. A flexible, client-oriented approach from AIIB, along with the extensive experience and capacity of the Implementing Agency, R&BD, was a main reason for the successful delivery of the Project. The

AIIB demonstrated a flexible and creative approach while maintaining high standards, which was perceived as a distinctive advantage of working with the AIIB. However, an over-reliance of the Implementing Agency on external consultants for core functions, such as project management and environmental and social safeguards, rather than building an in-house capacity, may hinder the Implementing Agency's ability to build its internal competencies. Balancing external support with the development of in-house expertise will enhance the agency's long-term effectiveness and sustainability.

85. Lesson 4: Streamlining contract packaging can enhance implementation efficiency. Managing projects with fewer, larger contract packages can enhance efficiency. The GRRP encountered challenges due to its 1,615 contract packages, which complicated monitoring and implementation. In contrast, AIIB's subsequent projects in India adopted a more streamlined approach with fewer contract packages, aligning with best practices observed in other MDB-supported rural road projects. This shift not only simplifies project management but also improves oversight and execution.

86. Lesson 5: Fostering sustainability by balancing in-house capacity development and cost-efficient outsourcing. Early engagement with borrowers and communities, supported by a robust GRM, is essential for building trust and ensuring smoother project implementation. To further improve sustainability and resilience in financed projects, AIIB should also focus on enhancing its supervision of E&S safeguards. This includes ensuring that detailed reviews of the annual monitoring reports submitted by the client are consistently conducted for ongoing compliance and risk management. While developing in-house E&S capacity within local agencies is critical for long-term sustainability, it is equally important to recognize the role of the private sector in offering cost-efficient solutions. A balanced approach that leverages both strong internal capacity and strategic partnerships with the private sector can optimize resource use, improve project effectiveness, and support sustainability. This dual strategy ensures that projects not only meet immediate objectives but also remain aligned with long-term development goals while managing costs effectively.

RECOMMENDATIONS

87. **The PLR presents six recommendations.** These are:

88. **Recommendation 1: Strengthen monitoring of project outcomes.** AIIB should enhance its RMF to include both output and outcome indicators, ensuring that expected long-term development benefits are effectively captured. CEIU recognizes that improvements in the guidance on RMFs and its consideration during appraisal have been made and welcomes efforts of PMD and SPB to improve the RMF for better monitoring of project outcomes and capturing broader project benefits. Progress indicators should be measured periodically and extend beyond project closure to assess medium- and long-term impacts in PLRs. Furthermore, AIIB should consider including measures during project implementation that would support borrowers to continue collecting relevant data after project completion. The adequacy of the RMF should be a major consideration during the appraisal process to facilitate comprehensive evaluations of project effectiveness and sustainability.

89. **Recommendation 2: Enhance the assessment of project success at completion.** AIIB should strengthen the quality of its final assessments of projects, as documented in the PCN, ensuring it covers all core aspects of project success and provides a comprehensive analytical evaluation. Adopting the practice of rating project performance would enhance accountability and transparency. CEIU welcomes that in the context of the Corporate Strategy Midterm-Review, it is planned to introduce a Project Completion Indicator and include a rating-based assessment of project success at completion, considering the dimensions of relevance, effectiveness, efficiency, and sustainability. Furthermore, AIIB should implement the common MDB practice of recalculating a project's EIRR at completion. At the time of project completion, one side of the cost-benefit analysis is complete: the final cost is calculated. The recalculation of the EIRR is crucial for assessing project efficiency and evaluating the actual costs and benefits of AIIB investments, ultimately contributing to more informed decision-making and future project planning. It is recognized that full benefits of a project may take years to materialize, which is considered at the time of the PLR.

90. **Recommendation 3: Strengthen internal knowledge management systems to support institutional memory development and knowledge transfer.** AIIB should enhance its internal knowledge management practices to ensure proper project documentation and the preservation of institutional memory, especially during periods of high staff turnover. It is essential that all project-related documents and data are systematically stored, archived, and made easily accessible to staff. CEIU recognizes that the development of knowledge management systems and

practices has progressed. However, improving interoperability across AIIB's systems and ensuring consistent knowledge management and archiving practices across departments will contribute to maintaining a robust institutional memory and facilitate effective knowledge transfer, ultimately supporting more efficient project implementation and continuous learning within the organization.

91. Recommendation 4: Streamline contract packages to support efficient implementation. For future projects that include multiple small scale infrastructure works, AIIB should promote the adoption of a smaller number of larger contract packages to enhance project management efficiency and alleviate the monitoring burden, while accommodating the context and structure of the respective project. Lessons learned from the GRRP indicate that managing numerous small contracts can strain project oversight, making it challenging to ensure timely implementation and quality control. A more streamlined contracting approach will facilitate better resource allocation, improve coordination, and ultimately lead to more successful project outcomes.

92. Recommendation 5: Strengthen project outcomes by engaging early and embracing flexibility in implementation. AIIB should capitalize on its flexible, client-oriented approach as a key strategic advantage. As the Bank expands, prioritizing early engagement with borrowers and implementing agencies is crucial for enhancing monitoring, ensuring compliance with environmental and social safeguards, and facilitating timely project adjustments. This proactive approach will help minimize risks and delays, particularly when project preparation is well underway, by aligning expectations and addressing potential issues at the outset.

93. Recommendation 6: Expand AIIB's local presence to facilitate project oversight and continuous client engagement. In alignment with the AIIB Approach to Global Presence approved by the Board in August 2024, AIIB should enhance its local presence when large and complex projects are being implemented. Establishing offices or expanding the presence of local representatives/consultants would enable more effective project monitoring, quicker response times, and stronger client engagement, especially for large and complex infrastructure investments. The experience from the GRRP highlights some of the challenges faced due to limited local oversight, underscoring the need for a more robust presence to facilitate timely decision-making and foster closer relationships with stakeholders particularly post-project closure. By investing in local capacity, AIIB can improve project implementation outcomes and ensure a greater alignment with regional needs and priorities.

Appendices

A. EVALUATION FRAMEWORK

Evaluation Criteria	Rating Scale	Evaluation Questions	Indicators/ Information Required	Source of Information	Methods/ Analysis
Relevance	*Highly Relevant* *Relevant* *Less than Relevant* *Irrelevant*	Was GRRP relevant to national and/or Gujarat priorities? Was GRRP aligned to AIIB's policies and strategies? Was GRRP design appropriate in addressing the envisaged impact, outcome, and outputs? Did the project inputs, outputs, and outcomes follow the logical results chain to achieve the project's objective?	Provincial socio-economic background Government development policies and data sources AIIB's corporate and sector strategies Project design and monitoring framework Project E&S documents of the client and consultants	Project Document, PCN, Member government documents, ELA Minutes of Board meetings, Project Committee meetings Discussions with project staff, government officials, and other key stakeholders	Desk review Key informant interviews Analysis of program design indicators
Effectiveness	*Highly effective* *Effective* *Less than effective* *Ineffective*	What socio-economic results came from AIIB-financing of GRRP? Were there effects on gender equality? Were there any unintended or adverse results on the local society and economy? Did GRRP comply with safeguard requirements? Are there residual or new issues post-completion? To what extent were project outputs, and AIIB-financed project and sector outcomes achieved as indicated in the expanded design and monitoring framework? What factors contributed to achievement/ non-achievement of expected outputs and outcomes?	Realized project outputs and outcomes in relation to the targets Project monitoring framework implementation process Issues and challenges related to achieving outputs and outcomes	PCN, Back to Office Reports Discussions with project staff, government officials, and other stakeholders Monitoring reports of outputs and outcomes	Desk review Key informant interviews Analysis of program design indicators

Evaluation Criteria	Rating Scale	Evaluation Questions	Indicators/ Information Required	Source of Information	Methods/ Analysis
Efficiency	*Highly efficient* *Efficient* *Less than efficient* *Inefficient*	How well were project resources used in achieving the expected outcomes? What were reasons for delayed or cancelled project activities and changes in project scope? What were the reasons for the project construction cost savings?	Loan disbursement and fund utilization data Implementation and procurement arrangements Monitoring data on inputs and outputs Economic rate of return	Project documents Discussions with project staff, government officials, and AIIB Procurement staff	Desk review Key informant interviews Cost-benefit analysis
Sustainability	*Most likely sustainable* *Likely sustainable* *Less than likely sustainable* *Unlikely sustainable*	What is the likelihood that project benefits will be sustained beyond the life of the project? Are there provisions for generating adequate revenue or funding for maintenance? Are there any institutional issues that affect the sustainability of the project? Are there any risks that may erode project environmental protection or social benefits and their distribution? Are there any risks that affect the project sustainability?	Assessment of revenue generating capacity and activities Information on beneficiaries	Discussions with project staff, government officials, project-affected people, and other stakeholders Government reports and statistics	Desk review Key informant interviews Direct observation through site visits

Evaluation Criteria	Rating Scale	Evaluation Questions	Indicators/ Information Required	Source of Information	Methods/ Analysis
AIIB Work Quality	*Highly satisfactory* *Satisfactory* *Less than satisfactory* *Unsatisfactory*	Was the project design, its theory of change and project results framework realistic and evaluable? Were Bank due diligence assessments and identified lessons adequate for preparing the financing and did they influence design? Was Bank monitoring, feedback, adaptive management, and derivation of lessons timely and adequate in implementation oversight?	Complete set of E&S consultant site assessments and gap closing arrangements Stakeholder consultation records, GRM registry information and awareness raising materials Final consultant E&S report	Project design and monitoring documents, change of scope requests E&S consultant reports and GRM records Discussions with project staff, government officials, stakeholders	Desk review Key informant interviews
Client Work Quality	*Highly satisfactory* *Satisfactory* *Less than satisfactory* *Unsatisfactory*	Was the quality of project preparation and project implementation by the client adequate? To what extent did the client ensure project sustainability? To what extent did the client comply with loan covenants, E&S requirements, and other requirements? Was there sufficient high-level support and stakeholder engagement for the project?	Project design and monitoring framework Monitoring data Complete set of E&S consultant site assessments and gap closing arrangements Stakeholder consultation records Final consultant E&S report	Project design and monitoring documents, change of scope requests E&S consultant reports and GRM records Discussions with project staff, government officials, stakeholders	Desk review Key informant interviews

B. EXPANDED RESULTS MONITORING FRAMEWORK

INPUTS

1. Financing of USD658 million – Government of Gujarat USD329 and AIIB USD329 (para. 24)

» Construction and upgradation of NPRs (cost split 50:50) = USD410 million (62% of total)

» Construction and upgradation of PRs (cost split 50:50) = USD242 million (37% of total)

» TA (100% AIIB) = USD3 million (less than 1% of total), including grant-financed technical consultant

» Experimental roads (100% AIIB) = USD2.18 million (less than 1% of total)

2. Of the total AIIB loan amount, up to 20% (USD65.8 million) as retroactive financing.
3. Services of Implementing Agency (R&BD)
4. AIIB supervision, supported by a consultant (para. 34).
5. AIIB ensuring design consistency, enhancing quality and safety aspects, improved sustainability by including maintenance requirements, and management of E&S risks (para.14).

ACTIVITIES

1. Procurement of nearly 1,400 small works contracts using an e-tendering platform (para. 37).
2. Funds flow using the reimbursement method (para 38).
3. Planning, management, and control of the project by the Implementing Agency (para. 29), including data collection and reporting based on R&BD's existing quality monitoring system (para. 31).
4. Planning, implementation supervision, monitoring and reporting on progress by the PMC (para. 22(1i))
5. Operation of the RPMS (para. 33)
6. Development of a digitized map of Gujarat's rural roads network (para. 22(ii))
7. Institutional development and capacity building in the areas of transport planning and management, contract law and contract models, economic analysis, and environmental engineering (para. 22(iii))
8. Transfer of knowledge on innovative technologies in construction, upgradation, and maintenance of roads (para. 23)
9. AIIB's supervision (para. 34)
10. Development of a generic ESMF with field-based assessment and sub-project specific ESMFs. Preparation of a Community Participation Framework and a RPPF. Conduct of an ESIA to generate baseline data (paras. 65-68)

OUTPUTS

1. All-weather rural roads (taking account of climate change – see paras. 43 and 44) provided to around 4,000 villages in all 33 districts of the state, with around 8 million beneficiaries (para. 12).

RMF Indicators	2019 Target
1) Total beneficiaries (millions)	8 million
2) Villages with new 1st connectivity (number)	364
3) Villages with new 2nd and 3rd connectivity	3650
1) New construction of NPRs	5044 km
2) Resurfacing of NPRs	2518 km
3) First connectivity of villages	593 km
4) Construction of missing link/structure	69
5) Approaches to school and colleges	2 km
6) Construction and maintenance of roads passing through tribal areas	233 km
7) PRs - Resurfacing of village and other district roads	4386 km
8) PRs - Widening of village and other district roads	1606 km
9) Upgradation of metal to black-top surface	206 km
10) Upgradation of earth to black-top surface	237 km
11) Upgradation existing causeway/deep to high-level bridge	24
Computer system development	100%

2. Maintenance for 5 years from completion of construction and upgrading of roads and other structures included in constructors' contracts (para. 14).

EXPECTED OUTCOMES

1. Increased agricultural productivity and industrial development with more favorable prices for agri-inputs and outputs (para. 11).
2. Reduced travel time (para. 11).
3. Improved healthcare access with more healthcare centers established (para. 11).
4. Increased literacy through better access to schools and more schools being built (para. 11).
5. New employment in agriculture and industry (para. 11).
6. Reduced share of bullock cart transport and increased share of vehicle transport – increased speed of travel, improved safety and passenger comfort, and reduced vehicle operating costs (para. 11).
7. Improved access to administrative services, law and order, and welfare establishments (para. 11).
8. EIRR of 15.8% – 14.1% for NPRs and 18.4% for RPs (para. 52).

C. DESCRIPTION OF VILLAGE SITE VISITS

This PLR encompassed visits to 13 villages across six districts in Gujarat. The sample included one small village, five medium-sized villages and seven large villages. Table 6 presents the size and location of the villages and the roads/bridges that were constructed/upgraded under the GRRP. In each village, the CEIU team inspected the road/bridge and conducted focus group discussions with village residents. In total, consultations were conducted with more than 50 local stakeholders, including 13 *Sarpanchs* (village heads), 13 school principals, and several health workers, teachers, and farmers.

Table 7: Overview of site visits.

Village & District	Population	Road/Bridge
Anindra (Surendranagar)	1,718	Aninndra to Bhadreshi Road (NPR New Construction) Bakarthali to Mulchand (Construction of Vented Causeway)
Rampara (Surendranagar)	5,457	Gundiyala to Rampara Road (NPR New Construction)
Mulada (Surendranagar)	1,160	Mulada to Navgada Road (NPR New Construction)
Kathada (Surendranagar)	1,922	Kathada Approach Road (NPR New Construction)
Rajpur (Mehsana)	1,221	Vadngar amar thol Darvaja bar daya talav Pancha mata to Rajpura joining Road (NPR New Construction)
Dasaj (Mehsana)	5,277	Visanagar Denap Kahoda Siddhpur Road (near Dasaj) (Construction of Bridge in place of existing causeway)
Namisara (Vadodara)	2,102	Vankaner Hamirpura Namisara Road (NPR New Construction)
Paniyara (Kheda)	475	Paniyara (Bhatera) Approach Road (First time Connectivity to Village)
Nava Bobha (Kheda)	1,220	Nava bobha Approach Road (First time Connectivity to Village)
Napa Talpad (Anand)	11,452	SH 75 to Ragadi visatar Road (First time Connectivity to Habitation)
Dehmi (Anand)	5,015	Dehmi Napad Road (Resurfacing of PR)
Wankaner (Vadodara)	8,770	Vankaner Hamirpura Namisara Road (NPR New Construction)
Gorsan (Vadodara)	717	Gorsan Approach Road (NPR Resurfacing)

Access to Health Care

Before the GRRP, all 13 villages faced strong healthcare access challenges, including lack of ambulance services, difficulty in emergencies, monsoon-related issues, high maternal and infant mortality risks, and limited access to immunization and healthcare outreach.

These issues were interconnected and compounded each other. For example, the lack of ambulance services combined with monsoon challenges made emergency situations even more dire. The difficulty in accessing healthcare facilities not only increased risks during emergencies but also discouraged regular check-ups and preventive care, leading to poorer overall health outcomes for the communities.

Changes after the GRRP

Improved ambulance services: All 13 villages now have access to ambulance services with response times ranging from 15 to 30 minutes Depending on the availability of the ambulance, if that block ambulance is not available, another nearby block ambulance comes during emergency situations.

Better emergency care: Residents of all 13 villages reported improved emergency response that allow for adequate care and save lives.

Reduced travel times to healthcare facilities: All 13 villages experienced considerable reductions in travel times. Some noteworthy improvements are shown in Table 8 below.

Table 8: Travel time to health facilities for selected villages

Village	Before	After
Anindra	2.5-hour journey to the nearest hospital	Reduced to 30 minutes
Rampara	Over one hour to C.U. SHAH Hospital	Reduced to 20 minutes
Mulada	Up to two hours to reach Patdi Hospital	Reduced to 30 minutes
Dasaj	Up to three hours to reach the main district hospital	Reduced to 35 minutes

Improved maternal and child healthcare: In seven villages, residents specifically mentioned improvements for maternal and child healthcare. This includes improved access from smaller settlements to the main village for the primary healthcare center, which experienced increasing patients. Furthermore, health workers can more easily reach surrounding settlements, for example to provide vaccination for children.

Access to specialized care: In six villages, residents specifically mentioned improved access to specialized or private hospitals in nearby cities.

Access to Education

Before the GRRP, all 13 villages faced educational access challenges. These challenges included long travel times to schools, difficulties during the monsoon season, high dropout rates, limited access to higher education, safety concerns for female students, and challenges faced by teachers in reaching schools. Students faced arduous journeys to reach their schools, often taking over 45 minutes to more than an hour each way. The lengthy travel times not only exhausted the students but also consumed large portions of their day, leaving little time for study or rest. The monsoon season exacerbated travel challenges in villages. Roads became muddy, slippery, and often impassable. These conditions not only hindered daily attendance but also posed safety risks to the students. Thus, villages experienced high dropout rates and frequent absenteeism due to the challenges in reaching schools. Students faced considerable obstacles in pursuing education beyond primary school due to the challenges in reaching the high schools. Safety concerns particularly affected female students as girls were hesitant to travel to high schools in other villages due to isolated and unsafe roads. Lastly, Teachers faced difficulties reaching the villages, often due to unsafe or deserted routes.

Changes after the GRRP

Reduced Travel Times to Schools (12 villages): Travel times to schools were reduced to just 10-15 minutes. For example, after the construction of a road in Anindra village, a school van pick-up and drop-off facility was introduced. As a result, students from other villages also started attending this school, and it saved them around 15 to 20 minutes of travel time. Mulada saw travel times to high schools reduced, enabling students to reach them within 30 minutes, compared to a journey time of more than one hour before.

Improved Attendance and Reduced Dropout Rates (13 villages): All villages that previously suffered from high dropout rates saw considerable improvements. For example, in Paniyara, a 100 percent attendance rate was achieved. Dehmi reduced its dropout rate from 15-20 percent to just two percent, as teachers could now reach the village in 20 minutes, ensuring regular classes.

Enhanced Access to Higher Education (Seven villages): Students in villages now have better access to higher education. Kathada students could easily reach high schools in nearby Dasada and Mandal, leading to increased high school enrollment. In Gorsan, travel time to Vadodara was reduced, allowing students to pursue further education, and enrollment of girls increased as a result. The improved roads opened opportunities that were previously inaccessible.

Introduction of School Transport Services (Six villages): Six villages—Anindra, Kathada, Dasaj, Paniyara, Wankaner, and Gorsan—benefited from new school transport services. Anindra introduced a pick-up and drop-off bus service, ensuring consistent attendance even during the monsoon. In Wankaner, the government under Sarva Shiksha Abhiyan provided transportation facilities, offering financial support to transport providers. These services made schooling more accessible and convenient for students.

Increased Enrollment Numbers (Five villages): Five villages saw strong increases in student enrollment. In Rampara, enrollment rose from 800 to over 1,100 students as the improved road allowed students from nearby villages to attend school regularly. Mulada expanded its primary school offerings to include grades 1-8, with enrollment increasing from 150 to 435 students. The better accessibility attracted more students and allowed schools to grow.

Increased Safety and Participation of Female Students (Four villages): Safety improvements encouraged more female students to continue their education in Mulada, Nava Bobha, Gorsan, and Namisara. In Nava Bobha, girls could now attend high school outside the village, which was rare before. Safer roads meant parents felt more comfortable allowing their daughters to travel for education. After the GRRP, the parents of girl students could also easily provide them with a pick-up and drop-off facility, which was previously difficult due to the time-consuming travel.

Better Teacher Accessibility and Reduced Absenteeism (Four villages): Teachers in Rajpur, Namisara, Paniyara, and Dehmi could now commute more easily, reducing absenteeism and improving education quality. In Namisara, the previously deserted route became safer, and teachers felt more secure traveling to the village. Dehmi teachers reached the village in 20 minutes, facilitating regular attendance and consistent teaching.

Parents No Longer Needed to Accompany Children to School (Three villages): In Anindra, Rajpur, and Gorsan, children could travel to school independently, freeing up parents' time. In Gorsan, the introduction of school vans and reduced travel times meant parents no longer had to walk their children to school. This change allowed parents to focus on other responsibilities while ensuring their children received education.

Agricultural Productivity

Before the GRRP, all 13 villages were constrained in their agricultural production. The villages faced strong challenges in transporting their agricultural produce. Farmers struggled with poor road conditions, particularly during the monsoon season, which made it nearly impossible to move their crops to markets. Farmers had to travel long distances to reach APMC markets, which was time-consuming and costly. Furthermore, farmers faced challenges in transporting perishable produce like bananas, leading to spoilage and reduced prices. Thus, farmers often avoided cultivating certain crops due to transportation concerns.

In many villages, farmers faced difficulties accessing their fields during the rainy season, limiting their ability to tend to their crops regularly. In one village, crop damage due to wildlife was a specific problem, where white-footed antelope (wild cows) would often damage crops.

Changes after the GRRP

Improved Transportation of Produce (13 villages): Transportation of produce became much easier, with traders often coming directly to the fields with trucks to collect the harvest. This change was particularly impactful in Anindra and Rampara, where farmers could now grow and transport any crop in any season. In Napa Talpad, farmers could load bananas directly onto trucks in the fields, consderably reducing spoilage and transportation time.

Enhanced Market Access (13 villages): Market access was greatly enhanced for all villages. For example, farmers from Anindra could easily reach APMC markets in Wadhvan, Lakhtar, and Surendranagar. Mulada farmers could efficiently transport crops to the Patdi APMC, while Nava Bobha farmers began delivering fresh vegetables to Dehgam and Kapadvanj APMCs daily. This improved access to markets led to better prices and increased income for farmers across the region. In Rampara Village, farmers can now transport their main products—cotton, seed oil, sorghum, and groundnuts—to markets more efficiently, resulting in a 12-15 percent increase in their incomes due to timely sales and reduced transportation delays. Mulada village has seen its salt producers benefit from better access to markets, especially in nearby villages like Kharagoda, leading to higher production levels and smoother sales processes. Similarly, in Kathada Village, farmers and dairy producers can transport goods to markets more frequently, leading to a 10-12 percent increase in local economic activity. The improved infrastructure has reduced transportation costs and time, enhancing profitability for those involved in agriculture.

Higher Agricultural Productivity (13 villages): The overall agricultural productivity increased across all 13 villages due to improved access to markets, better farming practices, and diversification of crops. For example, Namisara residents reported a 40 percent increase in agricultural income over eight years, highlighting the substantial economic impact of road construction on rural agriculture.

More Efficient Farming Practices (Seven villages): Farming practices became more efficient in many villages. In Kathada, farmers could now easily access their fields with tractors, even during the rainy season. Rajpur farmers could visit their fields more frequently using vehicles, leading to better crop management. Dasaj farmers experienced a 10 percent increase in agricultural productivity due to easier field access, demonstrating the tangible benefits of improved infrastructure.

Increased Crop Diversity (Five villages): Crop diversity increased considerably in several villages. Rampara farmers started growing vegetables, which they had previously avoided.

Napa Talpad began cultivating a variety of crops including bananas, tobacco, millet, papayas, potatoes, and various vegetables. Wankaner saw a notable increase in the cultivation of bananas, tobacco, and sorghum.

Increased Land Values: The infrastructure improvements have spurred economic growth and increased land values in several villages. In Nava Bobha, land prices surged from approximately ₹5 lakh to ₹15-20 lakh per acre after the road construction, reflecting heightened demand and investment interest. The farmers use their land as collateral for loans, with the increasing value of land facilitating their access to finance.

Increased Dairy Production (Five villages): Improved roads have created new employment opportunities for dairy production, often providing new earning opportunities for women. In Mulada Village, the establishment of a local Milk Cooperative Unit has allowed women involved in animal husbandry to sell milk daily without needing to travel outside, considerably boosting the dairy business and their earnings. In Rajpur Village, women in the dairy sector have reported a 30 percent increase in income due to the daily sale of milk, as milk collectors now come directly to their village.

Economic Development and Employment

Before the GRRP, all 13 villages were constrained in their economic development. The villages faced challenges in accessing employment opportunities in surrounding factories. Furthermore, the development of small local businesses was challenging due to the access to supplies.

Changes after the GRRP

Development of Local Businesses and Industries within the Village (Eight villages): Enhanced connectivity has led to the growth of local businesses and industries, creating employment opportunities within the villages. In Rampara Village, the improved road has encouraged traders to visit more frequently, bringing household goods that were once only available in Surendranagar City. This has strengthened the local economy by attracting more business and providing residents with better access to products. In Paniyara Village, new businesses such as small shops and food stalls have opened, creating jobs, and contributing to the local economy. Namiasara Village has seen growth in local businesses post road construction, with villagers easily traveling to the main city to purchase goods for resale in the village. Additionally, some villagers invested in autos and vans, starting transportation services as a new source of income.

Employment Opportunities for Women (Six villages): Improved roads have created new employment opportunities for women, enhancing their participation in the workforce and contributing to household incomes. Kathada village has seen 25 women secure employment at a nearby Suzuki manufacturing plant, facilitated by reliable transportation due to the

improved road. Nava Bobha village has women working as nurses and teachers in nearby towns, opportunities that were previously inaccessible. Dasaj Village has seen women commuting to nearby small towns for teaching jobs, and nurses and doctors from other villages now visit Dasaj regularly, all made possible by the improved connectivity due to the new bridge.

Increased Access to Employment Opportunities Outside the Village (Six villages): The construction of new roads has expanded employment opportunities for villagers by improving connectivity to nearby towns, cities, and industrial areas. In Anindra Village, better road conditions have enabled more residents to commute daily for labor work to locations 15 kilometers away. Similarly, in Paniyara Village, approximately 20 percent of the population now travels daily to work in nearby Gujarat Industrial Development Corporation areas and companies, resulting in a substantial 50 percent increase in income for these individuals. Nava Bobha Village also witnessed a shift, with 10 percent of villagers beginning to work outside the village in nearby areas like Ahmedabad, Kapadvanj, and Dehgam. Villagers now have better access to distant employment centers due to improved road infrastructure, reducing travel time and increasing job opportunities. In Dehmi Village, approximately 10-15 percent of villagers travel to Anand and Vidyanagar for work in agriculture, masonry, and construction, benefiting from enhanced road access. The improved infrastructure has expanded the radius within which villagers can seek employment, thereby increasing their earning potential.

Enhanced Mobility for Migrant Workers and Improved Public Transportation (Three villages): The new roads have facilitated easier movement for migrant workers and improved public transportation services. In Rajpur, before the road was built, public transportation was available only along the main road, which meant villagers had to travel there to catch a bus. Since the road's completion, public bus services have increased from four to seven times a day. Additionally, the new road has allowed auto-rickshaws to operate within the village, providing better local transportation options that were not possible before the road was constructed. Public transportation services now run more than five times a day, along with expanded private transportation options, greatly enhancing mobility for residents.

Increase in Industrial Employment within the Village (Two villages): The construction of roads has attracted industrial establishments to some villages, creating local employment opportunities. In Napa Talpad Village, two new companies have been established post road construction. One company manufactures automatic motors, solar motors, and submersible pumps, employing 300 workers, with 30-35 percent being locals. The other is a plywood company employing 100 workers, with 2-3 percent from the local population. These industries have provided employment opportunities within the village, reducing the need for long commutes, and contributing to the village's economic development.

Growth in Tourism (One village): Improved accessibility has led to the growth of tourism in villages with tourist attractions, boosting the local economy. Just ahead of the village of Dasaj, there is a Goga Maharaj temple where an annual fair is held. Many pilgrims now use the Dasaj bridge constructed under GRRP to travel to the temple and to attend the fair, benefiting local vendors and shop owners. In this way, the Dasaj bridge has also contributed to the economic growth of the area. Enhanced connectivity has attracted traders, boosted local businesses, and created opportunities for small enterprises. The increased visitor numbers have provided economic benefits to residents through lodging, markets, and services catering to pilgrims and tourists.

Other Outcomes

Improved Social Connectivity and Community Engagement: The construction of new roads and bridges has enhanced social connectivity among the villages. Residents now find it much easier to attend social events, religious ceremonies, weddings, and festivals in neighboring villages. For instance, in Rampara and Mulada, villagers who were previously isolated due to poor road conditions can now travel with ease, even during the monsoon season. This improved accessibility has strengthened community bonds and fostered a greater sense of unity among the villages. In Dasaj, the new bridge has facilitated increased attendance at the annual fair held at the Goga Maharaj temple, benefiting local vendors, and enhancing cultural exchange. Similarly, Nava Bobha has seen a rise in marriage arrangements within the village, as families from other areas are now more willing to establish connections due to improved accessibility.

Safety Awareness and Road Safety Improvements: Road construction has led to increased safety awareness and improvements in road safety practices among villagers. In Paniyara, there is a noticeable rise in safety consciousness, with residents consistently wearing helmets when traveling by motorcycle to the city. The reduction in accidents, especially during the rainy season, has been reported in several villages due to better road conditions.

This Project Learning Review (PLR) report presents the findings of an independent assessment of the Gujarat Rural Roads Project (GRRP) in India, supported by the Asian Infrastructure Investment Bank (AIIB). The GRRP in India was AIIB's first stand-alone financing in the roads sector, making it a unique Project for AIIB. Approved in July 2017, AIIB provided a USD329 million loan to support the Government of Gujarat's Chief Minister's Rural Roads Program. The Project aimed to improve rural road connectivity for approximately 4,000 villages across 33 districts, directly benefiting around eight million people by enhancing access to services and fostering economic growth. This PLR was conducted by Complaints-Resolution, Evaluation and Integrity Unit (CEIU) and is based on evidence on the GRRP's preparation and implementation. The purpose of this PLR is to assess the results achieved under the Project, understand their drivers, and derive lessons for continuous improvement in AIIB's processes and project financing.

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