



1. Project Data

Project ID

P124639

Project Name

IN: PMGSY Rural Roads Project

Country

India

Practice Area(Lead)

Transport

L/C/TF Number(s)
IBRD-79950,IBRD-88640,IDA-48480,IDA-30-Nov-2015
48490
Closing Date (Original)

30-Nov-2015

Total Project Cost (USD)

1,624,066,138.73

Bank Approval Date

20-Dec-2010

Closing Date (Actual)

15-Dec-2020

IBRD/IDA (USD)
Grants (USD)

Original Commitment

1,500,000,000.00

0.00

Revised Commitment

1,669,999,877.34

0.00

Actual

1,624,066,138.73

0.00

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2. Project Objectives and Components

a. Objectives

According to the International Development Association (IDA) Financing Agreement (p.5) dated January 14, 2011, the project objective was “to support the strengthening of the systems and processes of the Program for the expansion and maintenance of all-season rural access roads, resulting in enhanced road connectivity, and better economic opportunities and social services for beneficiary communities in the Participating States,” where the Program is defined as a nationwide rural roads program called Pradhan Mantri Gram Sadak Yojana (PMGSY). The International Bank for Reconstruction and Development Loan Agreement (p.1) signed on the



same day does not include the project objective but refers to the project description in the IDA Loan Agreement.

The Project Appraisal Document (PAD, p.6) defines the project objective with slight modification in formulation but without any material change in the objective as “to support the strengthening of the systems and processes of the national PMGSY rural roads program for the expansion and maintenance of all-season rural access roads, resulting in enhanced road connectivity to economic opportunities and social services for beneficiary communities in the participating states.”

The project objective in the IBRD Loan Agreement for Additional Financing (p.5) dated May 31, 2018 is defined as “to strengthen the systems and processes of the national PMGSY rural roads program for the expansion and maintenance of all-season rural access roads, resulting in enhanced road connectivity to economic opportunities and social services for beneficiary communities in the Participating States.” This formulation of the project objective is very similar to the formulation in the PAD with one difference that it reads as “to strengthen” rather than “to support the strengthening.”

b. Were the project objectives/key associated outcome targets revised during implementation?

Yes

Did the Board approve the revised objectives/key associated outcome targets?

Yes

Date of Board Approval

18-Jun-2018

c. Will a split evaluation be undertaken?

No

d. Components

According to the IDA Financing Agreement (p.5) the project consisted of two components:

A. PMGSY Program Financing. (*Appraisal cost: US\$1,440 million; revised cost at Additional Financing: US\$2,310 million; actual cost at project closing: US\$1,635 million*)

This component was to support the implementation of the Eligible Expenditure Program that included the following:

- a. Provision of new all-weather access roads to unconnected habitations, including bridges and necessary cross drainage works as per the national PMGSY rural roads program guidelines in the participating states, and
- b. Upgrading of existing access roads to all weather standards and key through routes or major link routes in rural areas as per the national PMGSY rural roads program guidelines in the participating states.



B. Institutional Strengthening. (*Appraisal cost: US\$60 million; revised cost at Additional Financing: US\$90 million; actual cost: US\$35.0 million*)

This component consisted of activities to strengthen the capacity of the National Rural Roads Development Agency (NRDDA) and other relevant agencies in carrying out the project and to support a road sector-wide reform. The activities to be financed under this component included, but not limited to, the following:

- a. supporting relevant research; and improving project documents, maintenance management systems, monitoring and evaluation systems, technical designs, planning techniques, and project coordination and reporting,
- b. supporting independent verification of performance and financial audits, and supporting citizen monitoring and grievance redress,
- c. providing project management and implementation support,
- d. providing machinery equipment, office and IT facilities, as necessary, and
- e. providing skill training to staff in the relevant agencies to support a long-term capacity building program.

Revised Components

At the time of the US\$500 million Additional Financing from the IBRD in 2018, the components were revised as follows:

A: PMGSY Program Financing. (An additional US\$970 million including 50 percent counterpart funding.)

- i. **Green and Climate Resilient Rural Roads.** Civil works for the construction and/or rehabilitation/ improvement of about 5,500 km of priority rural roads and standalone bridges in nine states, as well as engineering features and new technologies for about 2,000 km of roads.
- ii. **Pilot Projects to Introduce New Technologies.** Pilot projects to demonstrate the use of green and climate-resilient road designs, innovative bridges, new technologies and retrofitting road safety and climate-resilient measures in pilot sections for the rehabilitation of about 1,500 km of existing roads.
- iii. **Rural Roads under the Original Project.** Civil works for construction and rehabilitation of about 4,000 km of rural roads and bridges under the Original Project in eight participating states.

B: Institutional Strengthening. (An additional US\$30 million including 50 percent counterpart funding.)

The sub-components of this component were modified, and new ones were added as follows:

- i. **Asset management (modified).** Support to development and implementation of state-level asset management plans; refinements in the rural road code network and district rural road plans; implementation of innovative maintenance contracts for rural road core network; piloting of surface dressing and other technologies for rural roads maintenance; and further refinement of state-level maintenance policies.
- ii. **Green and climate-resilient rural roads strategy (new).** Developing a green and climate-resilient strategy for PMGSY including network level vulnerability assessments; revision of existing design and construction standards; and detailed engineering designs to pilot retrofitting climate resilience in existing rural roads and bridges.
- iii. **Skills development and gender-targeted opportunities (modified).** Further refinement of the PMGSY training framework to develop a comprehensive Human Resources Professional



Development Strategy for rural road agencies and construction industry including training materials, international and local training, study tours, workshops, counterpart training.

- iv. **Road safety management (new).** Establishing state-level Rural Road Safety Action Plans and supporting implementation by preparation of road safety engineering designs for retrofitting road safety measures to the existing rural roads network, technical documentation, district level road safety plans, capacity building of rural road and other related agencies, awareness programs for local governments, communities and work zone safety, integration of road safety in the asset management system and road safety audits of priority rural roads.
- v. **Program Management Strengthening (modified).** Supporting system-wide improvements for the PMGSY rural roads program, incorporating international best practices, through the improvement of PMGSY documentation systems; the refinement and expansion of the Online Management, Monitoring and Accounting System (OMMAS); the refinement of PMSGY e-procurement system and the Procurement & Contract Management Manual; the development of a medium term rural roads vision (strategy) document; the implementation of the recommendations of the PMGSY Assessment Report; and the carrying out of studies on further evolution of the PMGSY rural roads program and/or the management of the rural road sector.
- vi. **Research and development (modified).** Establishing centers of excellence and an accelerated testing facility for and facilitating the participating of PMGSY's technical agencies in carrying out research and development on rural roads cost-effective designs, using local materials and new technologies; capacity building programs for rural road agencies; and performance evaluations of new rural roads technologies/innovations.
- vii. **Outcome monitoring (modified).** Carrying out outcome monitoring studies of PMGSY roads including their contribution towards poverty reduction, employment, income generation, health and education outcomes, and the achievement of the Sustainable Development Goals, all disaggregated by gender.
- viii. **Rural transport services and agriculture supply chain (new).** Carrying out studies on prospective cost-effective, reliable and safe improvements to rural transport services through PMGSY rural roads network, catering to the needs of women and the poor and promoting the use of clean fuel/electric vehicles; and carrying out studies on possible trade and logistics improvements in rural areas to maximize the positive impact of rural roads on agricultural supply chains.
- ix. **Engineering design, project management and implementation (modified).** Developing cost-effective climate-resilient engineering designs for PMGSY rural roads and associated surveys and research; carrying out engineering supervision of civil works and independent quality monitoring of PMGSY rural roads in Participating States; providing project management (including techno-financial) support to National Rural Roads Development Agency (NRRDA) and the State Rural Roads Development Agencies (SRRDAs); carrying out performance auditing services for the Project; and providing equipment support for office communication, research and monitoring, planning and design, IT tools/software, and quality assurance systems to NRRDA and the SRRDAs of participating states, for the carrying out of the PMGSY rural roads program.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost: The total project cost was originally estimated at US\$1,500 million. At the first restructuring in December 2013, the total project cost was revised down to US\$1,400 million due to the cancellation of US\$100 million IDA funds (see Financing below). At the Additional Financing in June 2018, the total project cost was revised up to US\$2,400 million because of project scope increase. At the restructuring in December 2020, just before project closing, the total project cost was revised down to US\$1,670 million



because of the cancellation of US\$230 million funds from Additional Financing and non-materialization of counterpart funds during project implementation (see Financing and Borrower's contribution below). On December 15, 2020, the project closed with a total cost of US\$1,624 million.

Financing: At appraisal, the IBRD loan (IBRD-79950) was estimated at US\$500 million and the IDA credit (IDA-48490) was estimated at US\$620.60 million. The project fully disbursed these funds. The second IDA credit (IDA-48480) that was estimated at US\$379.40 million disbursed US\$100 million less because of the cancellation of this amount at the first restructuring in December 2013 that was to be reallocated to other IDA-financed projects upon the request of the Government of India. An Additional Financing of IBRD loan (IBRD-88640) of US\$500 million was approved in June 2018, but US\$230 million of this amount was cancelled at the last restructuring in December 2020 just before project closing because of unutilized funds. The project fully disbursed the remaining US\$270 million from Additional Financing by project closing.

Borrower's contribution: At appraisal, no borrower's contribution was estimated. At the Additional Financing in June 2018, the borrower's contribution was estimated at US\$500 million. At project closing, no borrower contribution materialized (see entries related to Additional Financing and eight project restructuring below). However, the government used its own funds to finance the road works after project closing. The World Bank project team stated that the borrower's contribution was estimated around US\$700 million at the time of project assessment in October 2021.

Restructurings: There were eight project restructurings and one additional financing:

- **First Restructuring (Level 2 – December 26, 2013):** An IDA credit amount of US\$100 million was cancelled to be allocated to other IDA-financed project upon the request of the Government of India because of slow project implementation.
- **Second Restructuring (Level 2 – December 5, 2014):** The indicator related to the travel time was dropped because majority of the habitations that gained access to road under the project had no vehicular travel previously. Therefore, a comparison of travel time between non-motorized travel before project and motorized travel after project could have been misleading. Additionally, the indicator related to access was modified from "share of population" to "share of habitation" to better align the indicator with the project objective and address lack of data on population due to the decadal frequency of census in India.
- **Third Restructuring (Level 2 – October 28, 2015):** The project closing date was extended by seven months from November 30, 2015 to June 30, 2016 because of delays caused by orientation of the State Rural Roads Development Agency (SRRDA) staff with the documentation of Environmental and Social Management Framework (ESMF), states' varying institutional capacity in conducting procurement, awarding of contracts, lack of capacity of construction industry, prolonged unfavorable seasons, law and order problems, inadequate staffing, inclusion of Bihar to the project scope as the eighth state in November 2013, inclusion of the International Labor Organization (ILO) to the project in February 2013, and deployment of personnel and procurement of consultants. About US\$34 million was reallocated from the technical assistance component to the civil works component because of underutilization. Lastly, US\$1.3 million was reallocated to a different category to process the payment to ILO for providing consultancy services for the preparation of Rural Roads Maintenance Manuals and Standard Contract Documents and Institutional Strengthening of Panchayati Raj Institutions.
- **Fourth Restructuring (Level 2 – May 26, 2016):** The project closing date was extended by 12 months from June 30, 2016 to June 30, 2017 to allow the National Rural Roads Development



Agency (NRRDA) to complete institutional development initiatives and ongoing rural road works, especially in the states of Bihar, which joined the project in November 2013.

- **Fifth Restructuring (Level 2 – June 29, 2017):** The project closing date was extended by four months from June 30, 2017 to October 31, 2017 to allow the NRRDA to complete institutional development initiatives and ongoing rural road works.
- **Sixth Restructuring (Level 2 – October 27, 2017):** The project closing date was extended by six months from October 31, 2017 to April 30, 2018 to allow the required time for processing the request of the Ministry of Rural Development (MoRD) for an additional financing of US\$500 million.
- **Seventh Restructuring (Level 2 – April 12, 2018):** The project closing date was extended by two months from April 30, 2018 to June 30, 2018 to keep the project alive until the proposed additional financing was approved. The approval of the additional financing was delayed because of extra time required to revise the safeguard instruments to include the new state of Tripura to the project scope.
- **Additional Financing (Level 1 – June 18, 2018):** An additional US\$500 million was approved to meet the funding gap (US\$150 million) of the original project and introduce green and climate resilient construction—for the first time in rural roads in the country—while widening the scope of the project to address institutional, road safety, low carbon and climate resilience, and gender issues. Additional financing was to finance 50 percent of the additional civil works, while the rest was to be financed by the counterpart funds. The state of Tripura was added to the project scope. The target value of the objective-level indicator “improved condition of PMGSY roads” increased from 55 percent to 68 percent in line with the increase in the project scope. Two new objective-level indicators were added to the results framework: improved effectiveness of public expenditure defined as kilometer (km) of roads that used green and climate resilient designs) and improved asset management defined as number of districts implementing performance and community-based maintenance contracts. A new disbursement-linked indicator (DLI), i.e., improved institutional effectiveness, was added that included two units of measures: staff accredited after training and public disclosure of annual performance reports. The original three DLIs were modified in accordance with the changes introduced to the project scope under the Additional Financing (see Revised Components above). The Additional Financing was to close on December 15, 2020.
- **Eight Restructuring (Level 2 – December 10, 2020):** The percentage share of the World Bank financing under additional financing was retroactively changed from 50 percent to 100 percent to frontload the project, and US\$230 million was cancelled from the additional financing amount. These changes were necessitated because the 30-month implementation period for the Additional Financing was found insufficient to implement the US\$1 billion civil works program in states with low implementation capacity and difficult hilly terrain. The introduction of climate resilient designs for rural roads in the country that required extra time and considerable efforts was another reason for the slower than expected implementation of project activities. Therefore, rather than extending the project closing date further, it was agreed to frontload the project and disburse the funds retroactively while cancelling almost half of the additional financing amount.

Dates: The project was approved on December 20, 2010. The loan and financing agreements were signed on January 14, 2011 and the project became effective on February 18, 2011. The Mid-Term Review was conducted in February 2014. An Additional Financing was approved in June 2018. The original closing date was November 30, 2015. It was extended by 30 months and the original loan and financing agreements closed on June 30, 2018. The implementation period of 30 months for the Additional Financing was not extended, and the project closed on December 15, 2020. The reasons for closing date extensions have been outlined in the project restructuring entries above.



Split rating. The PDOs remained unchanged with the AF. The scope of the project was increased to address institutional, road safety, low carbon and climate resilience, and gender issues. The target value of the PDO indicator “improved condition of PMGSY roads” was increased from 55 percent to 68 percent in line with the increase in the project scope. Two new PDO indicators were added to the results framework: improved effectiveness of public expenditure defined as kilometer (km) of roads that used green and climate resilient designs) and improved asset management defined as number of districts implementing performance and community-based maintenance contracts. A new disbursement-linked indicator (DLI), i.e., improved institutional effectiveness, was added that included two units of measures: staff accredited after training and public disclosure of annual performance reports. Therefore, this review is not based on a split rating of objectives.

3. Relevance of Objectives

Rationale

The project objective remains highly relevant to the country context. Absence or insufficient access of rural habitations to roads is a barrier for rural social and economic development. The 2019-2024 vision document of the Ministry of Rural Development notes the need to connect all rural habitations with a population size of at least 250 through all-season roads in order to improve their connectivity to local markets, schools, and health clinics. According to the “Strategy for New India” published in November 2018 by the NITI Aayog—the policy think-tank of the Government of India—creation of modern rural infrastructures and integrated value chain systems are necessary for transforming rural economy, which depends firstly on increasing rural road access. Expansion of rural road networks has long been a priority for the federal and states governments in India. While some states have insufficient implementation capacities, the country, overall, has so far been successful in making gains in terms of rural habitation connectivity. Through the implementation of a US\$38 billion national rural roads program (i.e., Pradhan Mantri Gram Sadak Yojana - PMGSY), access of rural habitations to all-season roads had already increased from 67 percent in 2010 to 90 percent in 2016. The project was designed to support to expand road access to a part of the remaining 10 percent of the rural habitations. Overall, because of its focus on enhancing rural habitations’ road connectivity to economic opportunities and social services, the project objective was outcome-oriented and appropriately pitched for the development status and capacity in the country.

The project objective was also aligned with the World Bank’s strategy as defined in Country Partnership Framework (CPF) for India, Fiscal Years 2018-2022. The project sought to address the development problem of insufficient or lack of connectivity of rural habitations to economic opportunities and social services. The Bank’s 2018 Systematic Country Diagnostic (SCD) for India identified the improvement of rural habitations connectivity through roads as a priority that would be expected to lead to higher incomes, more occupational choices, increased female entrepreneurship, and improve educational and health outcomes. The project was to address this problem through supporting the construction and rehabilitation of all-weather rural roads and technical assistance to strengthen the overall systems and processes of the PMGSY national program. The project objective corresponds to the CPF’s “Objective 1.1: Promote more resource-efficient, inclusive, and diversified growth in the rural sector” under “Focus Area 1: Resource Efficient Growth” and “Objective 2.3: Improve connectivity and logistics” under “Focus Area 2: Enhancing Competitiveness and Enabling Job Creation” (CPF, pp.413 and 61).



The World Bank has been a development partner of India in rural road network development since the inception of PMGSY program in 2000 first through technical assistance, and later through the World Bank-financed Rural Roads Project (RRP1 – US\$400 million). RRP1 was implemented in four states, i.e., Himachal Pradesh, Jharkhand, Rajasthan, and Uttar Pradesh. The design of the current project, which was the second in the series of World Bank-financed interventions to support PMGSY, benefited from the experience gained in the implementation of RRP1 and other rural development projects implemented in India with rural roads components. As mentioned in the previous paragraph, the project, in addition to the construction and rehabilitation of all-season rural roads, focused on strengthening the overall systems and processes of the PMGSY national program, and on the effective application of those systems and processes in seven participating states (i.e., Rajasthan, Uttar Pradesh, Jharkhand, Himachal Pradesh, Uttarakhand, Meghalaya, and Punjab). The innovative aspect of this project was that it was designed on a result-based approach introducing disbursement-linked indicators (DLIs) that included a mixture of intermediate outcome, implementation performance, and institutional change indicators. Overall, the project objective and the project's intervention, both in terms of contents and geographical scope, were more challenging compared to earlier interventions.

The relevance of the objective is rated High.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To strengthen the systems and processes of the national PMGSY rural roads program for the expansion and maintenance of all-season rural access roads, resulting in enhanced road connectivity to economic opportunities and social services for beneficiary communities in the Participating States.

Rationale

Theory of Change. The project funds were to be used to support the implementation of PMGSY national program for the expansion and maintenance of all-season roads. Project funding was structured on three disbursement-linked indicators (DLIs), and a fourth one was added at the Additional Financing (DLIs are explained in the Outputs section below). DLI 1 was to directly support the construction and rehabilitation of rural roads. DLI 3 was to support the sustainability of the road network through improved maintenance, including preparation and adoption of asset management plans, planned maintenance contracting, and public disclosure of annual maintenance plan. These activities would be expected to result in increased and sustained access of rural habitations to the road network.

Activities under DLI 2 had a mixture of intended outcomes. Establishment of a GIS-based road and bridge and condition database, and the development of a rural roads project preparation manual would be expected to lead to the expansion and better maintenance of rural roads, complementing the activities under DLIs 1



and 3 that are explained in the previous paragraph. However, other activities under DLI 3 would be expected to increase climate resiliency (such as roads constructed using green and climate-resilient designs, and assessment of roads to identify the critical sections and bridges to climate-induced events) and safety of roads (such as preparation and adoption of road safety plans). These activities would also be expected to indirectly support the sustainability of rural road network and habitations connectivity.

Activities under DLI 4, which was added at the time of Additional Financing, were designed to increase institutional capacity through the training and accreditation of NRRDA staff and improve transparency and accountability through regular public disclosure of rural roads operations and maintenance annual performance reports. These activities would be expected to contribute to the strengthening of the systems and processes of the PMGSY program.

The project was also to provide technical assistance for the achievement of the activities listed under each DLI and support project management, such as training, research and development, engineering design, gender-targeted activities, outcome monitoring, acquisition of equipment, asset management, green rural roads strategy, road safety management, and program management strengthening. These technical assistance activities would be expected to strengthen the systems and processes of the PMGSY through improved effectiveness of public expenditures in road construction and rehabilitation, and execution of road maintenance works under the PMGSY program, while improving the effectiveness of the institutions implementing the program.

Project outputs of technical assistance and direct program support to PMGSY (i.e., strengthened systems and process of the PMGSY and the construction and rehabilitation of rural roads) would be expected to result in the intermediate-outcome of increased all-season road access to rural habitations, sustainability of which would be ensured through performance and/or community-based contracts and climate resilient designs. These intermediate outcomes would be expected to lead to rural populations' better and sustained connectivity to economic opportunities and services, such as non-agricultural employment opportunities in nearby town or city centers and easier access to markets, schools, and health clinics or hospitals. In the long-run, these would be expected to lead to an increase the economic and social welfare of the rural populations.

The ICR (p.7) lists the critical assumptions as follows: (i) The technical assistance activities are fully implemented; (ii) the government adopts, trains, and uses maintenance techniques and other capacity building efforts; good construction quality is achieved, and the constructed roads are adequately maintained, with sufficient investments in district road networks; and (iv) adequate interest on the part of the government and capacity to implement green and climate resilient designs.

Overall, the causal pathways from inputs to expected results were valid and direct. The intermediate outcomes achieved could be attributed to the project's intervention and expected to contribute to the achievement of the project objective within the national PMGSY rural roads program.

Outputs

- DLI 1 – Extent of habitation connectivity achieved.
 - Number of habitations benefited with improved connectivity. The target for the original DLI was 39,500 habitations with a baseline of 26,300. The achievement was 50,420. However, the achievement under Additional Financing was 1,200 against the target of 2,000. By the time of the project assessment in October 2021, the number of habitations with road access had increase to 2,387 (with the use of Government's own funds after project closure).



- DLI 2 – Effectiveness of public expenditures.
 - Establishing a GIS based road and bridge inventory and condition database. The target was 20 districts with a baseline of two districts. The achievement was 637 districts in all 28 states.
 - Improved planning system. National Rural Infrastructure Development Agency (NRIDA) issued a project preparation manual for rural roads and shared it with all states implementing road works under PMGSY. This manual was adopted by 13 states. The target was adoption of the manual by at least two states.
 - Roads constructed using green and climate-resilient designs and new technologies . The target was 2,000 km or roads. At project closing, the achievement was 1,488 km. By the time of the project assessment in October 2021, the length of roads constructed using green and climate-resilient designs and new technologies was 3,410 km.
 - Vulnerability Assessment. The target was to implement vulnerability assessments for a 5,000 km road section, but none could be implemented because of no responsive bidders.
 - Road Safety Action Plans. Only four states, i.e., Meghalaya, Madhya, Pradesh, Odisha, and Chhattisgarh prepared road safety action plans against the target of 10 states. Other states are at various preparation stages of action plans.
 - Procurement and contract management manual. NRIDA was to issue a revised “Procurement and Contract Management Manual” for the project and at least five participating states were to utilize it in the implementation of civil works. NRIDA prepared the revised manual in consultation with the World Bank, but it was not finalized. Hence, no state could adopt it.
- DLI 3 – Percentage of improved network under maintenance contracts.
 - Asset Management Plans. The target was ten states to adopt asset management plans. The project supported the preparation of a generic framework for asset management plans. Only two states, i.e., Bihar and Assam, prepared these plans for the operation and maintenance of rural roads.
 - Planned maintenance contracting. At least 50 districts were expected to implement performance based and/or community-based maintenance contracts including those implemented by women self-help groups. The achievement was 103 districts in six states.
 - Public disclosure of annual maintenance plans. At least 20 districts were expected to publicly disclose annual maintenance plans through Online Management, Monitoring and Accounting System (OMMAS) and SRRDAs’ websites. Twenty-seven districts from Chhattisgarh prepared and disclosed their annual maintenance plans. The achievement was higher than the target, but the reports were prepared by only one state out of 8 participating states.
- DLI 4 – Improved institutional effectiveness.
 - Staff accredited after training. The target was 2,000 members of NRRDA and SRRDA staff to be accredited after completing minimum of two training modules prescribed under the training framework of PMGSY. The achievement at the time of project assessment in October 2021 was 2,007 members of staff but only on one module. In order to achieve the highest number of members of staff attending trainings, state agencies nominated their officials for only one training module. Cancellation of some training activities because of the onset of COVID-19 in March 2020 also adversely affected the training program.
 - Public disclosure of annual performance reports. Similar to the public disclosure of annual maintenance reports, at least 20 districts were expected to publicly disclose annual performance reports through OMMAS and SRRDAs’ websites. Twenty-seven districts from Chhattisgarh prepared and disclosed their annual performance reports. The achievement was



higher than the target, but the reports were prepared by only one state out of 8 participating states.

- A total of 48,000 km of rural roads were constructed and rehabilitated in eight states. No target was set for this activity.
- PMGSY roads with pavement condition index of 2.0 or higher increased to 87 percent from a baseline of 55 percent. The target was 68 percent. (A pavement condition index of lower than 2.0 indicates poor condition of the road.)

Outcomes. The results framework did not include any indicator to capture the impact of enhanced road connectivity on rural population's better access to economic opportunities and social services. This was a significant shortcoming of the M&E design. However, the ICR provided data from various studies that were conducted by the World Bank and other institutions to assess the socio-economic impacts of PMGSY and larger rural road construction projects. Some of the key findings of selected studies are listed below (ICR, Annex 7):

- The Road to Opportunities in Rural India: The Economic and Social Impacts of PMGSY, Matías Herrera Dappe, Muneeza Mehmood Alam, and Luis Andres, Mobility and Transport Connectivity Series, The World Bank Group, 2021
 - Travel time decreased. The beneficiaries' travel time, specifically to work, decreased, while the distance travelled remained the same. Reductions in travel time were higher in hilly areas.
 - Increased access to economic opportunities triggered a change in rural employment structure. A shift from farm employment to non-farm employment, particularly non-farm employment outside the habitation was observed in habitations with access to rural roads.
 - Farm-to-market connectivity improved with limited impact on farming practices. An eight percent increase was observed in the share of crops transported to markets for sale in PMGSY program areas. But increased road access had limited impact on the diversification of farming practices.
 - Positive, but limited, impact on living conditions. In the PMGSY program areas a positive (albeit limited) improvement was observed in the living conditions of the beneficiaries because of increased economic activity and limited wealth creation. This manifested itself as adding a pressure cooker (for cooking) or a radio to the households' assets.
- Market Access and Structural Transformation: Evidence from Rural Roads in India, Sam Asher and Paul Novosad, 2016.
 - Labor is reallocated out of agriculture to manual labor markets. Increased road access resulted in labor movement in the form of commuting, near large cities, or short-term migration from rural habitations to larger towns and cities. Increased access to road did not have a material impact on the growth of non-farm sector in rural areas but facilitated the access of rural labor to external employment resulting in nearly ten percent increase in earnings.
- Rural Road Infrastructure and Agricultural Production: Evidence from India, Yogita Shamdasani, National University of Singapore, 2021.
 - Positive impact on agriculture practices. Increased access to roads, especially in remote areas, results in crop portfolio diversification, adoption of modern agricultural technologies, and increased use of hired-labor.



Rating

Substantial

OVERALL EFFICACY

Rationale

While the length of roads constructed or rehabilitated at project closing was lower than the target values, the counterpart continued with project activities beyond project closing using its own funds and the road works - related target values were achieved at the time of project evaluation in October 2021. These achievements are adequately captured by the project's result framework. Technical assistance activities were mostly delivered but some targets could not be achieved, such as vulnerability assessment of 5,000 km of roads, road safety actions plans, and road asset management plans. The results framework did not include any indicator capturing the project's impact on increased access to economic opportunities and social services. Therefore, the ICR provided evidence from other impact evaluation and studies of rural road investments and the PMGSY Program, not specifically related to the activities included in the project scope, to assess the achievement of the project outcome in increasing economic opportunities and social services. The evidence from such reports and studies show that rural road projects, specifically the PMGSY program, had an overall positive impact on the socio-economic well-being of rural population. Overall, while there were some shortcomings in the achievement of technical assistance outputs and the project's outcomes could not be directly captured, the project's efficacy in achieving the project objective is rated Substantial based on the achievement of the outputs, mostly related to the road works and maintenance arrangements, at the time of project evaluation and evidence from non-project funded impact evaluation and studies.

Overall Efficacy Rating

Substantial

5. Efficiency

Economic Analysis

At appraisal, economic benefits of road access were defined as more favorable prices for inputs and outputs because of improved access to markets, improvement in school attendance by both students and teachers because of the availability of all-weather road, and timely access to health services resulting in a decrease in mortality and morbidity rates. The costs were defined as the construction of roads in each state and maintenance costs. It was estimated that on average habitations linked by a 3.4 km road at a cost of US\$0.21 million. Annual routine maintenance costs were set at one percent of construction costs, and periodic maintenance costs over a ten-year period at 35 percent. The cost-benefit assumptions were appropriate for a rural road access project. However, since the project covered thousands of habitations, a range of parameters for both benefits and costs were analyzed through a "Monte Carlo" simulation for each state, rather than economic analysis. The simulation resulted in a net present value of US\$210 million at a discount rate of 10



percent. The economic rate of return (ERR) was estimated at 12.2 percent for all states, with some small upland states not passing the viability test (PAD, p.15).

The above approach is called 'production surplus approach,' and as the ICR (p.41) states it is "usually recommended for low volume roads with less than 100 vehicles per day." For roads above 100 vehicles per day traffic 'consumer surplus approach' is considered to be a better methodology because benefit estimations are better defined; traffic data are collected more easily; all incremental economic and social activities related to the road improvements are reflected in traffic; and priorities that reflect economic and social considerations are better assigned because people travel for a wide variety of reasons (ICR, p.41). The benefits defined under the production surplus approach, i.e., favorable prices, increased school attendance, and improved health, were captured under 'increased number of trips' under the consumer surplus approach. Using this approach, the ERR at Additional Financing was estimated at 22.3 percent.

At project closing, Monte Carlo simulation was repeated using the actual numbers for both original project scope and the Additional Financing scope under consumer surplus approach. These calculations resulted in ERRs of 16.5 percent and 21.7 percent, respectively, confirming the viability of the project. The increase in the ERRs at project closing is linked to the lower actual project costs.

Operational and Administrative Efficiency

The closing date of the original loan and financing agreement was extended by 31 months because of initial procurement delays, slow implementation of road works and technical assistance activities. The project had to be restructured multiple times to keep the project alive until the approval of the Additional Financing, which was delayed because of the safeguard assessment of a new state added to the project scope. The 30-month implementation period estimated for Additional Financing was not sufficient to complete all road works, which led to the cancellation of US\$230 million and frontloading the remaining balance while increasing the World Bank's financing share. Insufficient implementation period for such a large-scale project resulted in under achievement of the targets by the time of project closing. Disbursement was slow in initial years of project implementation because of strict DLI requirements that were partially addressed in December 2014 and at the time of Additional Financing.

Overall, because of the shortcomings in the operational and administrative efficiency, the project's overall efficiency in achieving the objective is rated Modest.

Efficiency Rating

Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	12.20	96.00 <input type="checkbox"/> Not Applicable



ICR Estimate	✓	16.50	98.00 <input type="checkbox"/> Not Applicable
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* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

Project objective was highly relevant to the country context and the World Bank's country strategy defined in the India Country Partnership Framework, FY2018-2022. The project's efficacy in achieving the project objective is rated Substantial taking into consideration that the output targets could only be achieved after project closing and evidence for the achievement of the outcomes expected from the project's intervention was gathered from impact assessment and analytical works conducted outside of the project. The project's efficiency in achieving the project objective is rated Modest because of the shortcomings in the operational and administrative efficiency of the project. Overall, the project's outcome is rated Moderately Satisfactory.

a. Outcome Rating

Moderately Satisfactory

7. Risk to Development Outcome

Technical risk to the sustainability of roads assets created under the project is low. The project supported the creation of Rural Road Network Management Units (RRNMU). These units are adequately equipped to implement routine maintenance of roads constructed or rehabilitated under the project. Some states have established fully computerized and easily accessible Road Maintenance Management Systems that are used to prioritize Annual Maintenance Plans for the entire road network annually. The routine maintenance of project roads has been contracted for five years. Districts have been implementing community-based maintenance programs. National Rural Infrastructure Development Agency (NRIDA) and MORD have been using a digital platform called Electronic Maintenance of Rural Roads to streamline maintenance-related tasks. Overall, from a technical perspective, the risk to the sustainability of roads assets because of inadequate maintenance is low.

Institutional capacity and financial risks to the sustainability of roads assets created under the project are moderate. While the states have technical infrastructure to maintain the roads, availability of financing varies among states. Lack of sufficient funds can adversely affect the sustainability of project's achievements. Additionally, the states have differing levels of planning and implementation capacities and their application of the asset management framework is not consistent. The government's commitment to development of states' capacities to ensure consistency and sustainability in maintaining road assets is high.

8. Assessment of Bank Performance

**a. Quality-at-Entry**

By the time of project entry, the government's goal to empower rural population through the provision of all-season road connecting them to economic opportunities and social services had already been of high strategic importance (PAD, pp.1-2). The project's approach to finance the government's national PMGSY program through disbursement-linked indicators supported by technical assistance activities was simple and straightforward. Safeguards and fiduciary aspects of the project were adequately assessed. Stakeholder consultations were adequately conducted during design preparation. Implementation arrangements were clearly defined. Ministry of Rural Development was responsible for overall implementation, which was to be supported by NRIDA at the federal government level and Rural Roads Development Agencies of the participating states at the state level.

The project benefited from the lessons learned during the implementation of the then on-going Rural Roads Project that led to the result-based approach implemented in this project to ensure the sustainability of roads through proper maintenance. The risks were mostly identified, and mitigation measures were in place. However, the implementation capacities of smaller states were overestimated, and the mitigation measures were inadequate to prevent implementation delays (ICR, p.22).

The M&E design had significant shortcomings in capturing the project outcomes of improved access to economic opportunities and social services (ICR, p.19). No indicator was defined to capture these outcomes, nor was a beneficiary survey designed to assess the project's impact on socio-economic activities of the beneficiaries (ICR, p.17).

The project implementation schedule was overly ambitious for a project with such a large scope (ICR, p.15). The DLIs were strictly defined that resulted in slow disbursement in the early stages of the project implementation (ICR, p.19).

Overall, the quality-at-entry is rated Moderately Satisfactory.

Quality-at-Entry Rating

Moderately Satisfactory

b. Quality of supervision

Supervision missions were regularly held every six months until the onset of COVID-19 in March 2020. The World Bank Task Team Leaders were stationed in the country office, which resulted in closer and frequent contact with government and project implementation unit officials beyond official missions. As the ICR (p.23) reports mission aide memoirs and Implementation Status and Results Reports were candid and adequately reflected project performance. The project team's supervision of fiduciary and safeguard aspects of the project was adequate. Following the findings of the Mid-term Review in January 2014, the project team proactively took measures to improve project performance through project restructurings through more efficient use of funds, revising the DLIs to accelerate disbursement, technical assistance to support the project implementation capacity of smaller states, and the processing of Additional Financing. However, the 30-month implementation period estimated for the completion of civil works under the Additional Financing was not realistic, which led to the cancellation of US\$230 million of project funds. The shortcomings in the M&E design in capturing the project outcomes were not addressed. No beneficiary



survey was conducted. Focus was more on the achievement of the project outputs and less so on project outcomes; hence, lower focus on the development impact of the project.

Overall, the quality of supervision is rated Moderately Satisfactory.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The formulation of the project objective “to strengthen the systems and processes of the national PMGSY rural roads program for the expansion and maintenance of all-season rural access roads, resulting in enhanced road connectivity to economic opportunities and social services for beneficiary communities in the Participating States” was complex. While the theory of change was sound, and the causal chain between project activities/outputs and outcomes were direct and valid, it was not adequately reflected in the results framework. The DLIs and indicators were output-oriented rather than outcome-oriented. The DLIs and indicators captured the construction and rehabilitation of rural roads, the number of habitations connected to the road network and outputs of some technical assistance activities, but the results framework did not include any indicator to measure the socio-economic outcome of the project’s intervention in terms of access to better economic opportunities and social services.

Being at the output level, the indicators were specific, measurable, and time-bound, and the baselines and targets were clearly defined. However, the indicators measuring the activities implemented under Additional Financing were not achievable because of the short implementation period estimated for those activities.

M&E design and arrangements were well-embedded institutionally; an Online Management, Monitoring and Accounting System (OMMAS) was set up to ensure transparency and monitor project progress.

b. M&E Implementation

The DLIs and the indicators included in the results framework were adequately measured. OMMAS was effectively used to collect project related data. Monitoring reports were prepared quarterly and verified by the performance audit consultant. Following the Mid-term Review, the DLIs were revised to improve project performance and accelerate disbursement. However, the significant shortcomings in the results framework in capturing the project outcomes were not addressed during implementation. Some indicators that were closer to the outcome level were deleted, such as the reduction in travel time (see Third Restructuring entry in section 2.e above). The monitoring framework established under OMMAS is expected to be sustained beyond project closing and completion of PMGSY program.



c. M&E Utilization

M&E findings were regularly communicated to various stakeholders including national and state-level project counterparts, and non-governmental entities, such as the project beneficiaries and road associations (ICR, p.20). M&E findings led to project restructurings, specifically following the Mid-Term Review, and the processing of the Additional Financing to increase the project scope. However, M&E data could only be used to provide evidence of achievement of project outputs, not outcomes, because of the absence of outcome-oriented indicators.

Overall, the M&E quality is rated Modest, because there were significant shortcomings in the M&E design making it difficult to assess of the achievement of project objectives and test the links in the results chain. The ICR addressed this shortcoming by providing data from impact assessments and studies about the socio-economic impact of rural roads built under the PMGSY program on the beneficiaries.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

The project was classified as Category A under Environmental Assessment (OP/BP 4.01) and triggered the Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36), Physical Cultural Resources (OP/BP 4.11), the Involuntary Settlement (OP/BP 4.12), and Indigenous Peoples (OP/BP 4.10) safeguards policies.

Environmental Assessment (OP/BP 4.01): The project was classified as Category A under this safeguard policy because of the potential significant environmental damage of the development of rural roads network at a such a large scale as planned under the PMGSY. These potential damages were adverse effect on natural drainage patterns, improper disposal of construction wastes, including earth cuts, landslides, soil erosion, siltation of water bodies, and degradation of scenic value. An Environmental and Social Management Framework (ESMF) -by modifying the ESMF of RRP1—was prepared to avoid, minimize, and mitigate potential environmental issues. An Environmental Codes of Practice consisting of 20 codes was prepared to serve as a systematic guide to ensure that environmental aspects were systematically identified and addressed at the sub-project level. The implementation of the codes was expected to ensure compliance with the Bank's safeguard policies and the regulatory requirements of the Government of India and individual States. The environmental aspects were included in the Detailed Project Reports and bid documents. Audits were conducted to identify operational issues and gaps with this safeguard policy. **The ICR (pp. 20-21) states that the project was compliant with the requirements of this safeguard policy without reporting its implementation.**

Natural Habitats (OP/BP 4.04): This safeguard policy was triggered because of the potential significant adverse impact of the construction of new rural roads in remote locations on natural habitats, such as protected areas, wildlife corridors, wetlands and forests. These issues were to be avoided or appropriately



mitigated by using results from the Environment Screening Exercise. This was expected to provide an early warning for appropriate decision making early on in the sub-project development cycle. The wildlife areas to be potentially affected by the project were studied and mapped by the Wildlife Institute of India. **The ICR (pp. 20-21) states that the project was compliant with the requirements of this safeguard policy without reporting its implementation.**

Forests (OP/BP 4.36): The project triggered this policy because of the potential adverse impact of road construction in states with a significant percentage of their geographical areas under forest cover, such as Himachal Pradesh, Jharkhand, Meghalaya, and Uttarakhand. **The ICR (pp. 20-21) states that the project was compliant with the requirements of this safeguard policy without reporting its implementation.**

Physical Cultural Resources (OP/BP 4.11): The PAD does not provide detailed information why this policy was triggered. **The ICR (pp. 20-21) states that the project was compliant with the requirements of this safeguard policy without reporting its implementation.** The World Bank project team confirmed that no physical cultural resource was affected by project activities.

Involuntary Settlement (OP/BP 4.12): While the construction of new roads and rehabilitation of roads would be on the existing tracks, the project triggered this policy because of potential acquisition of land where available width of the roads was too small. A Social Management Framework was prepared supplementing the ESMF. Because of the varying institutional capacities of the states, land acquisition was implemented under different approaches. States used one of the following three approaches: acquisition under national legislation, direct purchase, or voluntary land donation. **The ICR (p. 21) states that the project was compliant with the requirements of this safeguard policy without providing detailed information about its implementation.**

Indigenous Peoples (OP/BP 4.10): Because of the potential adverse impact on the indigenous people in the form of land acquisition or environmental issues, the project triggered this policy. A Vulnerability Framework was prepared supplementing the ESMF to address vulnerability resulting from social identity, notably gender, scheduled cast, and scheduled tribe. In project areas where scheduled tribes represented over ten percent of the population of a participating village, a free, prior and informed consultation was to be held with scheduled tribes to seek their support for the sub-project. **The ICR (p. 21) states that the project was compliant with the requirements of this safeguard policy without providing detailed information about its implementation.** The World Bank project team confirmed that indigenous people were adequately involved in the project activities through consultations and the project did not have an adverse impact on indigenous people.

b. Fiduciary Compliance

Financial Management. Financial management arrangements at NRDDA were considered adequate for the project (PAD, p.17). A computerized financial management system including an Online Management, Monitoring, and Accounting System (OMMAS) was used for project financial management. OMMAS produced accounting data and quarterly interim financial report that were acceptable to the Bank. Audited project financial statements were unqualified. The project complied with the financial management legal



covenants. The ICR does not report any misprocurement or any misuse of funds associated with the project. The project's financial management was rated Satisfactory.

Procurement. Country procurement systems were adopted with some modifications to make them compliant with the World Bank procurement requirements. Transparency and efficiency were achieved with the use of e-procurement system. In 2013, the use of the e-procurement system became mandatory for all rural road projects in the country.

Around 25 percent of the contracts in 2012 and 2013 required rebidding mostly because of low level of competition in remote project areas. A Bank Procurement Performance Review was conducted in 2013 and 2014. This led to improvements in the bidding process, and 7,000 contracts were successfully awarded by March 2014. The onset of COVID adversely affected some contracts in 2020 without any negative impact on project implementation. Project's procurement performance was rated Satisfactory during project implementation.

c. Unintended impacts (Positive or Negative)

None.

d. Other

The project's results framework included two indicators to capture the project's impact on gender:

- The project was to support 50 workshops for gender-based capacity enhancement. Such workshops were regularly organized at the state-level. However, exact number of workshops organized by states was not available at the time of project assessment.
- A total of 2,000 women were expected to be involved in post-construction maintenance contracts through Women Self-Help Groups. Only 700 women were involved in maintenance contracts for 277 km of roads under 35 Women Self-Help Groups in Uttarakhand.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	
Quality of M&E	Modest	Modest	
Quality of ICR	---	Substantial	



12. Lessons

Three lessons are taken from the ICR.

Results-based financing of large-scale national programs can be an effective and efficient way of achieving development impact. The project scope included project activities dispersed over a large geographical area consisting of multiple states. The activities required procurement of around 12,000 contracts over nine states, the management of which would almost be impractical under a conventional investment project financing. Results-based financing through disbursement linked indicators facilitated the World Bank's support to the already on-going PMGSY and allowed the disbursement of US\$1.6 billion for rural roads development. However, successful implementation of results-based financing depends on extensive preparation such as identification of relevant DLIs and eligible expenses, and compliance of country systems with the requirements of the World Bank's fiduciary and safeguards policies.

DLIs with strict requirements can adversely affect disbursement and project implementation. The original DLI matrix was not clearly defined nor flexible to account for unforeseen challenges. The inability to meet some strict requirements of the DLI matrix was the main reason for slow disbursement. For example, clear weightage was not given in case habitations were connected to the road network but the road could not be utilized fully due to various different reasons such as safety concerns and partially incomplete features. Similarly, DLI requirements for staff accreditation training could not be met because only one module was completed instead of two because of the onset of COVID-19 pandemic. Some flexibility was introduced to the DLIs at the project restructuring in 2014 and Additional Financing in 2018 after which disbursements accelerated.

Insufficient implementation period for complex investment activities can result in cancellation of project funds and under-achievement of project outputs and outcomes. An additional financing in the amount of US\$500 million was approved in 2018 to scale up the project scope both in terms of construction of more roads and the inclusion of climate resilient and road safety features in road designs. However, the implementation period of these activities was estimated at 30 months, which was unrealistic. The onset of COVID-19 in March 2020 adversely affected project implementation, too. Towards project closing, it was decided that some project activities could not be completed in time, and a time extension would not be granted because the project closing date had already been extended by a total of five years and it was uncertain how project activities could be implemented during COVID-19 pandemic. As a result, US\$230 million from Additional Financing was cancelled, and at the time of project closing in December 2020, most of the output targets expected under Additional Financing could not be achieved.

13. Assessment Recommended?

No

14. Comments on Quality of ICR



The project closed on December 15, 2020. The ICR was delayed by six months to allow the completion of the works by the counterpart using its own funds.

The ICR is candid and provides a detailed overview of the project. The ICR, including its annexes, presents an appropriate base to support the achievements reported, which are mostly at the output level; the M&E data are used to provide evidence of achievement of outputs because of limitations in the results framework in capturing the project outcomes. There is also a genuine effort to use the findings of non-project-financed assessment reports and studies on PGMSY and rural roads to provide evidence for the project's socio-economic development impacts. The ICR is internally consistent; the logical linking and integration of the various parts of the report is adequate. The lessons are based on evidence and analysis; they respond to the specific experiences and findings of the project. However, there are some minor shortcomings in following the guidelines; Safeguards and Fiduciary sections could have benefited from a more detailed discussion in accordance with the guidelines. Overall, the quality of the ICR is rated Substantial.

a. Quality of ICR Rating

Substantial