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IMPLEMENTATION COMPLETION AND RESULTS REPORT

IDA-54250

ON A

CREDIT

IN THE AMOUNT OF SDR 69.2 MILLION

(US\$107 MILLION EQUIVALENT)

TO

India

FOR THE

Mizoram State Roads II- Regional Transport Connectivity Project
October 24, 2021

Transport Global Practice
South Asia Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective Jun 24, 2021)

Currency Unit = Indian Rupee (INR)

INR 74.20 = US\$1

US\$ 0.0135 = INR 1

US\$ 1.4288 = SDR 1

FISCAL YEAR

April 1 –March 31

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
AIDS	Acquired Immuno-Deficiency Syndrome
AMS	Asset Management System
BoQ	Bill of Quantities
BOT	Build-Operate-Transfer
C-C	Chhumkhum - Chawngte Road
COVID-19	Coronavirus Disease of 2019
CPS	Country Partnership Strategy
CRN	Core Road Network
C-Z	Champhai - Zokhawthar Road
DPR	Detailed Project Report
EE	Executive Engineer
EHS	Environmental, Health, and Safety Guidelines
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMF	Environmental Management Framework
EMP	Environment Management Plan
ESCE	Environmental and Social Engineering Cell
ESHS	Environmental and Social Health and Safety
ESMF	Social Management Framework
FA	Framework Agreement
FM	Financial Management
FMR	Financial Monitoring Report
FY	Financial Year
GDP	Gross Domestic Product
GIS	Global Information System
GoI	Government of India
GoM	Government of Mizoram
GRM	Grievance Redress Mechanism
GSDP	Gross State Domestic Product
GSHP	Gujarat State Highway Project
HDM	Highway Development & Management Model
ICB	International Competitive Bidding
ICD	Inland Container/Clearance Depot
ICT	Information and Communication Technology
IDA	International Development Association
IFC	International Finance Corporation
IFRs	Interim Financial Reports
INR	Indian Rupees
IPDP	Indigenous Peoples Development Plan
IPF	Investment Project Financing
IRC	Indian Roads Congress
IRR	Internal Rate of Return
IRSP	Implement Road Sector Policy
ISM	implementation support missions
ISP	Implementation Support Plan
ISR	Implantation Status Report
IT	Information Technology

IUFR	Interim Unaudited Financial Report
LA	Land Acquisition
LOC	Letter of Credit
LPI	Logistics Performance Index
L-T-K	Lunglei –Tlabung – Kawrpuichhuah
M&E	Monitoring and Evaluation
MATS	Moveable Asset Tracking System
MizoRAMS	Road Asset Management System for Mizoram
MoRTH	Ministry of Road Transport and Highways
MSRP	Mizoram State Roads Project
MTRM	Mid-Term Review Mission
NCB	National Competitive Bidding
NER	North-East Region
NH	National Highway
NPV	Net Present Value
NSC	North-South Corridor
OPRC	Output and Performance based Road Contract
ORAF	Operational Risk Assessment Framework
PAHs	Project-Affected Households
PAP	Project Affected Person
PCC	Project Coordination Consultant
PCM	Procurement and Contract Management Manual
PCN	Project Concept Note
PDO	Project Development Objective
PIU	Project Implementation Unit
PMC	Project Management Consultant
PMR	Procurement Management Report
PMU	Project Management Unite
PPC	Project Preparation Consultants
PPEs	personal protective equipment
PPP	Public-Private-Partnership
PR	Project Report
PWD	Public Works Department
R&R	resettlement and rehabilitation
RAMS	Road Asset Management System
RAPs	Resettlement Action Plans
RSMP	Road Sector Modernization Plan
SA	Social Assessment
SAARC	South Asia Association for Regional Cooperation
SaaS	Software as a Service
SAR	South Asia Region
SASEC	South Asia Sub-Regional Economic Cooperation
SDGs	Sustainable Development Goals
SIAs	Social Impact Assessments
SMF	Social Management Framework
STEP	Systematic Tracking of Exchanges in Procurement
T-K	Tlabung – Kawrpuichhuah
ToC	Theory of Change
WBG	World Bank Group

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P145778	Mizoram State Roads II- Regional Transport Connectivity Project
Country	Financing Instrument
India	Investment Project Financing
Original EA Category	Revised EA Category
Full Assessment (A)	Full Assessment (A)

Organizations

Borrower	Implementing Agency
Republic of India	Public Works Department of Mizoram

Project Development Objective (PDO)

Original PDO

The proposed Project Development Objective is to increase transport connectivity along regional trade corridors in Mizoram.



FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
World Bank Financing			
IDA-54250	107,000,000	105,660,000	95,532,887
Total	107,000,000	105,660,000	95,532,887
Non-World Bank Financing			
Borrower/Recipient	0	0	0
Total	0	0	0
Total Project Cost	107,000,000	105,660,000	95,532,887

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
12-Jun-2014	10-Oct-2014	27-Nov-2017	31-Oct-2020	30-Apr-2021

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
14-Oct-2020	73.06	Change in Loan Closing Date(s) Cancellation of Financing Reallocation between Disbursement Categories

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Moderately Satisfactory	Moderately Satisfactory	Modest

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	22-Nov-2014	Satisfactory	Satisfactory	0



02	29-Jun-2015	Satisfactory	Moderately Satisfactory	3.76
03	11-Jan-2016	Satisfactory	Moderately Satisfactory	6.14
04	04-Aug-2016	Satisfactory	Moderately Unsatisfactory	11.96
05	20-Feb-2017	Moderately Unsatisfactory	Unsatisfactory	16.32
06	18-Oct-2017	Moderately Unsatisfactory	Unsatisfactory	24.95
07	18-Apr-2018	Moderately Unsatisfactory	Moderately Unsatisfactory	29.52
08	21-Jun-2018	Moderately Satisfactory	Moderately Satisfactory	34.22
09	13-Feb-2019	Moderately Satisfactory	Moderately Satisfactory	42.78
10	24-Jul-2019	Moderately Unsatisfactory	Moderately Unsatisfactory	52.60
11	15-Jan-2020	Moderately Unsatisfactory	Moderately Unsatisfactory	58.03
12	14-Jul-2020	Moderately Satisfactory	Moderately Satisfactory	71.01
13	12-Jan-2021	Moderately Satisfactory	Moderately Satisfactory	75.34
14	30-Apr-2021	Moderately Satisfactory	Satisfactory	89.90

SECTORS AND THEMES

Sectors

Major Sector/Sector (%)

Transportation 100

Public Administration - Transportation 5

Rural and Inter-Urban Roads 95

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)

Economic Policy 33

Trade 33

Trade Facilitation 33



Private Sector Development	33
Regional Integration	33
Urban and Rural Development	34
Rural Development	34
Rural Infrastructure and service delivery	34

ADM STAFF

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. Despite its potentially advantageous geographic location between Myanmar and Bangladesh, Mizoram state in India's North-eastern Region (NER) is one of the poorest states in the country. Mizoram's low economic development is in large part due to its landlocked location, poor infrastructure, and limited linkages with the markets and ports of neighboring countries, including Bangladesh, Nepal, Bhutan, China, and Myanmar, which are physically closer to Mizoram than the rest of India. Transport/travel from Aizawl, the capital of Mizoram, to Delhi involves an approximately 2,400 km journey via the congested 11 km wide Siliguri corridor and a journey of 1,547 km to the nearest Indian port of Kolkata. The nearest major Indian city from Aizawl is Guwahati (Assam State, NER), which is about 500 km away; it takes about two days to cover this distance because of the under-developed and poor condition of the road network. Improving transport links within the NER and with Bangladesh, especially Chittagong Port, which is only about 100km away from the border of Mizoram – would therefore have a very significant impact, both by lowering prices for Mizoram's consumers and businesses, and by giving Mizoram (and other NER states) access to the wider markets accessible via Bangladesh.
2. Complementing the South Asia Association for Regional Cooperation (SAARC) Multi-modal Transport initiative, the governments of Bangladesh, India and Nepal agreed in 2011 to enhance connectivity for the NER to Bangladesh to facilitate bilateral trade, as well as trade with third countries. The World Bank's South Asia Regional Strategy recognizes regional cooperation and integration as a key strategic objective. The World Bank Group (WBG) is also well placed to address SAARC's regional connectivity and economic growth objectives, as the WBG's national portfolios and growing regional connectivity portfolio address many of the building blocks to regional connectivity and growth highlighted in SAARC's vision and strategies.
3. The project was designed based on the experience gained from the completed Mizoram State Roads Project (MSRP, P069889), the Bank's first significant transport project in NER. Lessons learned from the MSRP and the factors on which this follow-on project focused on are: (i) ensuring good quality engineering designs to mitigate against increases in the costs of works contracts; (ii) ensuring good contractor quality and contract management to mitigate against implementation delays and cost increases; (iii) planning for the difficult terrain and the short construction season to better manage construction cost increases and supervision costs; (iv) addressing gaps in implementing agency capacity, including fiduciary capacity and project management capacity; and (v) making a sufficient provision in a contingency fund to mitigate against the uncertainties associated with the above factors.
4. The Government of India's (GoI's) 12th Five-Year Plan aimed to develop a more balanced multimodal transport network to link the NER to the rest of the country. The strategy also emphasizes safety—especially for women—energy efficiency, environmental conservation, and social impact. By the end of the Plan, it was envisaged that all villages would be connected to an all-weather road, and most national and state highways would be upgraded to a two-lane standard or better. The Plan also prioritized institutional strengthening, enhanced accountability, and capacity building among the various state and national highway agencies.



5. The overarching objective of the World Bank Group’s India Country Partnership Strategy (CPS) for FY2013–17 was to support poverty reduction and shared prosperity. This objective was closely aligned with the vision for development outlined in the country’s 12th Five-Year Plan (FY2013– 17), which called for “faster, sustainable, and more inclusive growth”, focusing on poverty reduction, equality, regional balance, empowerment, environmental management, and employment. Economic integration—nationally and regionally—was central to the WBG’s strategy in India and supporting the Government to respond to the country’s massive infrastructure needs was a large component of the program.
6. Previous studies carried out by the Bank to develop India’s country strategic framework laid the foundation for the sector assistance strategy for road sector modernization and highlighted the essential elements of the strategic framework, with the objective to transform road agencies from the role of “provider” to “manager” of road infrastructure. The project design included two outcomes under the CPS engagement area of economic integration: improved transport connectivity and strengthened regional trade and infrastructure integration, along with the outcomes for road sector modernization and performance enhancement through institutional strengthening. The project design was also in line with the WBG’s gradual rebalancing of its program towards low-income states like Mizoram that, despite recent strong growth, remained behind All India averages in terms of Gross State Domestic Product (GSDP) and a range of human development indicators, and were also heavily impacted by cross-border issues.

Theory of Change (Results Chain)

7. The retro fitted theory of change (ToC) of the project to address the issues highlighted above is illustrated in Figure 1.

Project Development Objectives (PDOs)

8. As per the Legal Agreement, the PDO is to increase transport connectivity along regional trade corridors in Mizoram.

Key Expected Outcomes and Outcome Indicators

9. Achievement of PDO outcomes was designed to be measured by the following indicators:
 - Indicator 1: Reduction of travel time on project corridors
 - Indicator 2: Increase of traffic along the project corridors

Key intermediate indicators included:

- Indicator 3: Roads improved/rehabilitated
- Indicator 4: Roads in good and fair condition as a share of total classified roads
- Indicator 5: District level road maintenance contracts implemented

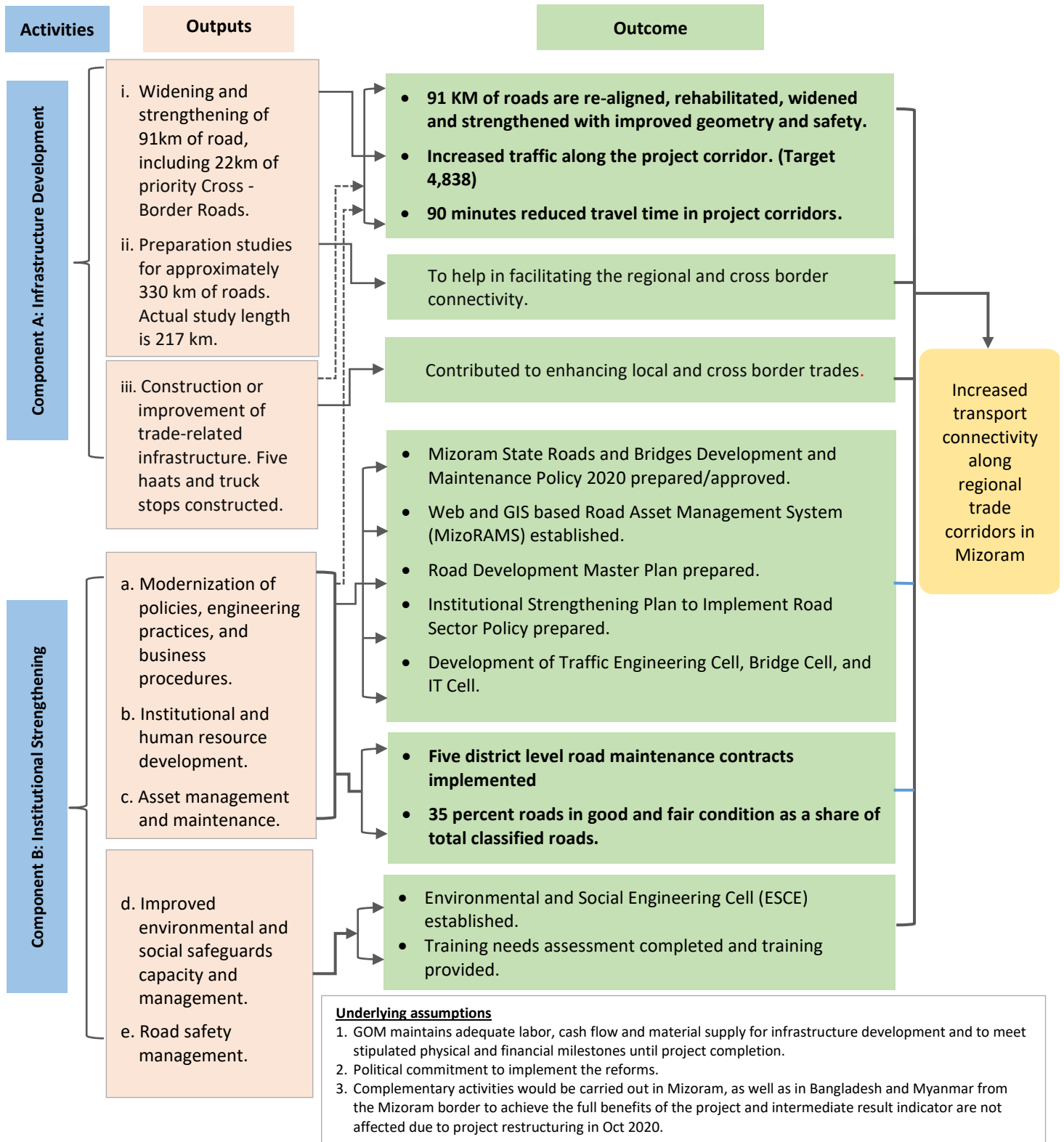


Figure 1: Retrofitted Theory of Change



Components

10. The project had two components: (A) Improvement of priority cross-border roads and trade-related infrastructure, and (B) Road sector modernization and performance enhancement through institutional strengthening.
11. **Component A: Improvement of priority cross-border roads and trade-related infrastructure (estimated cost US\$ 102.00 million, of which IDA financing is 100%. Actual cost at closing, total US\$ 93.98 million):**
 - i. Widening and strengthening of 91km of road and preparation studies for approximately 330km of road (estimated cost US\$99 million):* Widening and strengthening of roads along three corridors: (i) Lunglei-Tlabung-Kawrpuchhuah (L-T-K) Road (approximately 22 km) on the border with Bangladesh; (ii) Champhai-Zokhawthar (C-Z) Road (approximately 27.25 km) on the border with Myanmar; and (iii) Chhumkhum-Chawngte (C-C) Road (approximately 41.53 km) on the North-South alignment connecting to the border roads with Bangladesh to the west and Myanmar to the south. Concurrently, carry out a detail design study for approximately 330 km of roads in the North-South Corridor and the remaining road sections along the Lunglei-Tlabung-Kawrpuchhuah Road, and carry out road safety improvements/engineering countermeasures on identified road corridors to demonstrate road safety good practices.
 - ii. Construction or improvement of trade-related infrastructure along project roads, including market haat structures and truck stops (estimated cost US\$3 million):* Improving the trade related infrastructure (e.g., market haats¹ and truck stops) to facilitate capacity enhancement in the CC, CZ and TK corridors.
12. **Component B: Road Sector Modernization and Performance Enhancement through Institutional Strengthening (estimated cost US\$ 5.00 million, of which IDA financing is 100%. Actual cost at closing, total US\$ 4.51 million).** This component is to support the gradual transformation of PWD into a modern road agency through the implementation of a Road Sector Modernization Plan (RSMP) and to carry out various institutional development initiatives introduced under the MSRP, with a focus on: (i) modernization of policies, engineering practices, and business procedures; (ii) asset management and maintenance; (iii) institutional and human resource development; (iv) road safety management; and (v) improved environmental and social safeguards capacity and management.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

13. The PDO remained unchanged throughout the project.

Revised PDO Indicators

14. The PDO indicators remained unchanged during the project.

¹ Haat: a market, especially one held on a regular basis in a rural area



Revised Components

15. There were no changes to the project components.

Other Changes

16. As a part of the restructuring, the following changes were made:
 - i. *Extension of the Loan Closing Date.* To make up for the lost time due to the COVID-19 pandemic-related lockdown imposed by the State and Central Governments from mid-March2020 to mid-April2020 and intermittently thereafter, the loan closing date was extended by six months, until April 30, 2021. This extension was essential for the completion of the remaining civil works under Component A, as well as the development of the Road Asset Management System (RAMS) under Component B.
 - ii. *Cancellation of Savings.* An amount of US\$1.34 million was cancelled in response to the Gol's call for repurposing savings under existing loans in response to the COVID-19 pandemic.

Rationale for Changes and Their Implication on the Original Theory of Change

17. The extension of the loan closing date and the cancellation of a small portion of the loan did not have any impact on the original Theory of Change.

II. OUTCOME

A. RELEVANCE OF PDOs

18. The PDO remains highly relevant to the WBG's India Country Partnership Framework (CPF) for FY18-FY22 (Report No. 126667-IN), in particular to CPF Focus Area 2: Enhancing Competitiveness and Enabling Job Creation. Some CPF elements and indicators are directly present as project activities, e.g., improving connectivity (upgrading and strengthening, rehabilitation and maintenance), leveraging private sector financing (innovative financing), supporting institutional capacity, and knowledge sharing platforms. The reduction in travel time along the project corridors, and the use of bioengineering in lieu of high energy cement-based slope stabilization, have reduced CO2 emissions in the project corridors significantly, thus contributing to the Bank's climate change strategy.
19. The PDO strongly supports the Gol's goals to: (i) Integrate the regional market in trade infrastructure (power and transport) and investment; and (ii) Update national and state highways to a minimum two-lane standard. The sectoral themes of the PDO- improve rural and inter-urban connectivity, domestic and international trade, trade facilitation and market access, rural service and infrastructure, and institutional development - are directly aligned with the indicators and targets to achieve the Sustainable Development Goals (SDGs) for "Sustainable Vision 2030 for Mizoram"². In addition, Mizoram is the north-eastern state in India, borders Assam and Manipur to the north, Tripura and Bangladesh to the west, Myanmar to the east and south "Look East Policy". Mizoram and Manipur are the land connection through Myanmar to east Asia. However, due to the

²<https://planning.mizoram.gov.in/uploads/attachments/e69d83919b9a45a04e7252f58f106bf6/mizoram-vision-2030.pdf>



instability in Myanmar economic activity is limited to local cross-border trade and transport.

Assessment of Relevance of PDOs and Rating

20. The overall relevance of the PDO is therefore rated “Substantial”.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

21. The road infrastructure constructed and designed under the project enabled the PDO outcome to be achieved, as: the T - K Road connects the western Mizoram horticulture belt to the Bangladesh border, and has the potential to connect to Bangladesh markets and to the Chattogram seaport; the C – Z Road forms a part of the proposed multimodal corridor connecting Mizoram to Myanmar and the Sittwe seaport, and extends to the Kaladan sea corridor linking Sittwe and Kolkata seaports; and the C – C Road has the connectivity potential to the “Trilateral Highway”, which is an essential link to the East Asia market comprising Myanmar, Thailand, Cambodia, Laos, and Vietnam. The trade facilitation facilities established alongside the regional connectivity roads enabled the consolidation of agricultural produce from Mizoram to be traded in the regional markets. The road sector modernization support created the capacity to ensure the sustainability of the regional connectivity infrastructure and enhanced cross-border supply chains by expanding the development of logistics infrastructure and facilitated the provision of logistics services by the private sector. The designed roads and bridges enable the post-project construction of critical regional connectivity infrastructure.
22. Project implementation enabled the Mizoram PWD to undergo a gradual transformation to a modern road agency, which enabled it to implement the Road Sector Modernization Plan (RSMP) and deepen various institutional development initiatives. The project formulated an institutional strengthening plan to implement road sector policy and discussed the creation of new cells and strengthened existing cells. The project’s contribution to improve the effectiveness of the Public Works Department increased operational capacity, updated policies, and plans, as well as knowledge capacity.
23. Investments under components A and B have contributed to an increase in the percentage of roads in good and fair condition to 35, exceeding the project intermediate indicator target of 30. The upgrading of the road segments (widening from single to intermediate/two lanes) has improved the standard of the road segments, which contributes to enhancing Road Safety.
24. **Improvement of Priority Cross Border Roads & Trade Related Infrastructure.** The improvement of transport connectivity and roadway capacity was to be achieved through Sub-component A1. Against the originally envisaged 91 km of project roads, the project funded the widening and strengthening of about 80.28 km of roads, of which 77.70 km was completed. Table 1 below provides the details by corridor. The condition of these three corridors is presented through pictures in Annex 8. Under the Sub-component A.2, the following infrastructure was constructed along the project corridors: Truck stop at Chhumkhum, Market shed at Lungrang, Vertical extension of the Chawngte market in the C-C Road corridor, Truck stops at Zokhawthar in the C-Z Road corridor and vertical extension of the market at Tlabung & Truck stop at Tlabung in the T-K Road corridor. The market-sheds provide a safe place for local communities to sell their produce and locally made



goods, while the construction of water storage and sewerage systems provide access to water and ensure public hygiene for road users and the traders. Truck stops built on the regional connectivity roads could contribute to enhancing cross-border supply chains/trade and have enhanced safety for both truck drivers as well as other traffic sharing the road and residents living along the project corridors. The markets are being used by the villagers.

Table 1: Outputs by Corridor

Sl. No	Road Sections	PAD Estimated Length (km)	Actual Construction Length (km)	Remarks
1.	C - Z Road	27.2	26.2	During construction, slight changes were made to the alignment and curves were improved, which resulted in the reduction in length from 27.2 km to 26.2 km.
2.	T – K Road	22.0	11.3	The original section proposed was from Lunglei to Kawrpuichhuah. However, the section from Lunglei to Tlabung was declared as a National Highway (NH) by MoRTH. Hence only the 22 km T- K section was retained in the project. However, due to re-alignment and improvement of curves in various sections, the road length was reduced from 22 Km to 11.30 Km. The Lunglei to Tlabung section is now being tendered by NHIDCL as part of the GoI program. The originally envisaged connectivity will be fully achieved on completion of this section.
3.	C - C Road	41.5	40.2	Due to a slight re-alignment and improvement of curves, the length of the road reduced from 41.5 Km to 40.2 Km.
4.	Total	90.7	77.7	

25. The traffic study shows the composition of traffic to be mostly two wheelers (44 percent) and cars/jeeps (32 percent), with commercial vehicles (more than three tons) at around nine percent. Mizoram residents are benefitting from increased connectivity, and therefore economic growth through the expected increased trade. Independent of the regional trade scenario, this project will enhance human development and economic growth prospects for Mizoram residents through increased intra-state connectivity. Women will especially benefit, as lower transport and trade costs have improved the competitiveness of Mizoram’s key export products, particularly in the agricultural and textiles sectors which employ significant numbers of women. The project roads have reduced travel time by half and have triggered significant socioeconomic benefits in the project influence area.



26. **Preparation of Detailed Studies and Designs.** Detailed studies and designs have been prepared for a further 217 km of the North-South corridor and the remaining section of the L-T-K Road. The Bank has provided comments on the environmental impacts of the proposed corridor. GoM is submitting a proposal to MoRTH for final clearance. The future implementation of the designs prepared under the project - including the Thega bridge (which is a continuation of the T-K Road at the border of Bangladesh and Mizoram) connecting Mizoram to Chattogram seaport, and the Aizawl multimodal corridor road connecting Mizoram to Myanmar - will enhance connectivity and trade with the neighboring countries. Most of these roads are greenfield and would also increase connectivity both within the state and also improve access to transport infrastructure and services for isolated communities. This will be complemented by the Asian Development Bank's transport and trade facilitation initiatives through the South Asia Sub-Regional Economic Cooperation (SASEC) Program (with which the Bank coordinates closely) that includes interventions to facilitate transport and trade between Bangladesh, India, Nepal, and Bhutan, including through the Siliguri Corridor.
27. **Road Sector Modernization and Performance Enhancement through Institutional Strengthening.** Given the state of the institutions at the time, the institutional development component was appropriately designed. It focused on the most important elements of modernization establishing a stable flow of Road Financing mechanism and a Road Asset Management System, as well as the training of critical mass of the Public Works Department (PWD), which had the potential to enhance the sustainability and resilience of the state road network. Implementation was successful. As a result, Mizoram Road sector now is significantly better in operations. The major activities that supported road sector modernization and institutional strengthening are summarized below.
28. **Modernization of Policies, Engineering Practices, and Business Procedures.** The GOM Road Policy Framework has been revised and the "Mizoram State Roads and Bridges Development and Maintenance Policy 2020" has been formulated. These include a long-term and comprehensive sector development policy, covering strategic planning, asset management, maintenance, safety, financing, capacity building, accountability, and modernization. A Road Development Master Plan has been drafted for the entire Mizoram state and is being finalized.
29. **Asset Management and Maintenance.** A Web and GIS based Road Asset Management System (RAMS) for Mizoram PWD (called MizoRAMS) has been developed under the project. It includes a Rural Accessibility Index module, an Economic Corridor Information System, a Green and resilient Right-of-Way module, and Bridge-culvert data collection. In addition, the Moveable Asset Tracking System (MATS) has been implemented. To provide regular backup service, network access to MizoRAMS has been developed, which ensures data security for the RAMS on the SaaS³ (software as a service) Model. With support from MizoRAMS, the Core Road Network (CRN) has been identified, and the legal framework to announce the CRN is in place. Mizoram PWD, with technical support from the PIU, has engaged in community contracting for the maintenance of roads in some road sections.

³ SaaS model is a cloud-based distribution model which makes the data available to the end users over the internet.



- 30. **Institutional and Human Resource Development.** Mizoram PWD has formulated an “Institutional Strengthening Plan to Implement Road Sector Policy”, and different units (e.g., Traffic Engineering Cell, Bridge Cell, and IT Cell.) have been established and staffed in the PWD. Staff of these cells have been provided need-based training.
- 31. **Road Safety Management.** Construction safety audits and road safety audits have been conducted along project corridors. Awareness campaigns and safety training were organized at the three road corridors for school and college students. The PWD is collecting and disseminating existing road safety guidelines and is establishing a research mechanism. However, the planned road accident recording system has not been established due to the lack of adequate technical guidance from the project.
- 32. **Improved Environmental and Social Safeguards Capacity and Management.** An Environmental and Social Engineering Cell (ESCE) has been established as a part of institutional reform and to implement environmental policies in line with the “Mizoram State Roads and Bridges Development and Maintenance Policy 2020” and the “Institutional Strengthening Plan (ISP) to Implement Road Sector Policy (IRSP)”. The ESCE focuses on building sustainable environment friendly roads through the proper application of soil bioengineering to deal with erosion and shallow seated landslides in the project road corridors.
- 33. As a result of the combined achievements of MSRP and the implementation of Component B activities, Mizoram has made significant progress on the key elements of the Indian Road Sector Modernization Framework, which comprises policy and planning; adequacy of funds; efficiency of funds; implementation capacity; safety; and logistics and services. Annex 7 summarizes the achievements and the areas for further improvement.
- 34. **Achievement of Indicator Targets.** Table 2 below summarizes the extent of achievement of the targets of the relevant PDO level and intermediate indicators. While travel times in the three corridors have reduced from the baseline of 293 minutes to 90 minutes, the target values for traffic volumes could not be met due to the COVID-19 pandemic related restrictions on freight transport and public transport. Traffic on the project roads had increased prior to the onset of the COVID-19 pandemic; however, this has not been quantified, as the traffic count was not conducted before the pandemic. As the negative impact of the COVID-19 pandemic continues to decrease in India, and economic activities improve, travel volumes are expected to increase as projected at the time of appraisal and the targets are expected to be met in the next year or so.

Table 2. Achievement of PDO and Intermediate Results Indicator Targets

PDO: To increase transport connectivity along regional trade corridors in Mizoram			
Indicator Name	Baseline 2014	End Target 2020	Achievement in April 2021
PDO Indicators			
Travel time on project corridors (Minutes)	293	204	90
Traffic along the corridors (Number)	3,456	4,838	2,416
Intermediate Results Indicators			



Component A: Improvement of priority cross-border roads and trade related infrastructure			
Road rehabilitated, Rural (Kilometers)	0.00	91.00	77.7
Component B: Road Sector Modernization and Performance Enhancement through Institutional Strengthening			
Roads in good and fair condition as a share of total classified roads (Percentage)	20	30	35
District level road maintenance schemes implemented (Number)	0.00	5	5

Justification of Overall Efficacy Rating

35. **Based on the discussion above on the outcomes of the infrastructure investments under Components A and B, as well as the results of the road sector modernization efforts and institutional strengthening of PWD under Component B, the efficacy of the project is rated Substantial. The drop in traffic count is due to Covid and the traffic will pick up as anticipated after the pandemic. The team considers the substantial rating is justifiable.**

C. EFFICIENCY

Assessment of Efficiency and Rating

36. **Economic Efficiency.** The economic analysis of the project roads was carried out at appraisal using the HDM-4 model. Ex-post economic analysis of the project roads was carried out using the same methodology. The table below presents the EIRRs estimated at appraisal and the ex-post EIRRs. The overall ex-ante project EIRR was 17 percent, while the overall ex-post EIRR is 17.2 percent; the EIRRs of the three priority corridors at completion are comparable to those estimated at appraisal. Details of the ex-post economic analysis are presented in the Annex 4.

Table 5: Results of the Economic Analysis at Appraisal and at Completion

Road Sections	PAD EIRR (percent)	Ex-Post EIRR (percent)	PAD NPV (US\$ million)	Ex-Post NPV (US\$ million)
Champhai-Zokhawthar Road	16.4	15.9	12.27	10.40
Lunglei-Kawrpuchhuah Road	15.5	18.2	8.38	8.70
Chhumkhum-Chawngte Road	20.9	17.7	36.75	26.40
Total	17.0	17.2	57.40	45.50

37. **Design and Implementation Efficiency.** The project was designed based on the experience under MSRP, which was the first significant transport project in one of the least developed, most remote, and hilliest regions of India. The project



design proved to be appropriate - with the right mix of infrastructure and institutional development activities – for the implementation capacity in Mizoram.

38. Despite the difficult ground conditions in Mizoram, as well as the impact of the COVID-19 pandemic in 2020, almost all planned project activities were completed with only a six-month extension of the credit closing date. Project implementation was rated Moderately Unsatisfactory for two years during 2016 – 2018 and for a year during 2019 – 2020; issues affecting implementation were identified (see Section III B) and addressed, and the project closed with a Moderately Satisfactory rating. Of the original credit of US\$107 million equivalent, US\$95.53 million was utilized, while US\$1.34 million was cancelled to provide funds to respond to the COVID-19 pandemic.
39. **Rating: Based on the above discussion of economic efficiency as well as administrative efficiency, the overall efficiency of the project is rated “Substantial”.**

D. JUSTIFICATION OF OVERALL OUTCOME RATING

40. **The ratings of relevance, efficacy and efficiency as Substantial qualify for a project outcome rating of either Satisfactory or Moderately Satisfactory.** Project outcome is rated Moderately Satisfactory, as the regional connectivity and trade benefits with neighboring countries can only be achieved on completion of non-project activities in Mizoram, as well as some cross-border initiatives and infrastructure in Bangladesh and Myanmar. Some examples include: preparation of a project in Mizoram to construct the Thega bridge and completion of construction of the Integrated Check Post on Mizoram side of the border; the Detailed Project Design (DPR) for the road connecting Thegamukh (Thega bridge) to Chattogram seaport is being prepared by the Government of Bangladesh; and the road segment in Myanmar is yet to be upgraded, given the difficult political situation.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

41. A Gender Plan was prepared to ensure women’s participation, welfare, safety, and security as a part of the project’s Resettlement Action Plan (RAP) and Indigenous Peoples Development Plan (IPDP). Accordingly, the project implemented women-friendly facilities in the construction camps, including temporary housing, health care facilities, day-creche facilities, and appropriate scheduling of construction works. Equal opportunities were provided to women, especially those in female-headed households, to participate during project implementation and become overall beneficiaries in the project.

Institutional Strengthening

42. Component 2 of the project focused on Road Sector Modernization and Performance Enhancement through Institutional Strengthening. Achievements of the project under this component are described in the Efficacy section.



Mobilizing Private Sector Financing

43. Project activities did not result in mobilizing private sector financing

Poverty Reduction and Shared Prosperity

44. Infrastructure improved under the project provided year-round access to rural communities (which comprise mostly poor people) to public facilities, markets, and workplaces. Livelihoods have improved due to better connection between farms and marketplaces and land values have appreciated. The project has helped in connecting various communities and villages which were separated because either the roads and bridges were non-existent or were damaged. Project activities also benefited the poor through construction jobs.

Other Unintended Outcomes and Impacts

45. No unintended outcomes or impacts have been reported during project implementation.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

46. The key factors during project preparation were:

- a. **Building on prior experience.** The project built on the experience gained during the implementation of completed and on-going highway lending operations in India, in particular the preceding operation in Mizoram, as well as analytical work in the sector. The project designs integrated operations and maintenance in road construction contracts to enhance the sustainability of investments and included road safety in the designs.
- b. **Project design.** The overall project design was appropriate to the conditions and institutional capacity in Mizoram and comprised only two components: for road construction and institutional development and capacity building. It included some innovative aspects, such as: (i) the application of bioengineering solutions for slope stabilization; (ii) truck stops to enhance freight logistics; and (iii) a comprehensive RAMS, with new modules for Economic Corridor Information System, Green and Resilient Roads and Rural Accessibility.
- c. **Institutional strengthening, Governance, and Road Safety.** The project included several institutional strengthening activities to develop PWD's operational capacity, policy planning and knowledge sharing, and road safety improvements.
- d. **Risk identification and mitigation measures.** The overall implementation risk to achieve the PDO was rated Moderate. However, risks relating to delays in procurement, market failures for innovative contracting, and staff turnover were underestimated. Mitigation measures to address market response issues were not effective.



- e. **Implementation readiness.** The project met the readiness criteria of Gol and the priority corridor contracts were procured in a timely manner. As noted in Table 1, the contracts for the three corridors needed to be amended to improve road alignments.
- f. **Procurement and Financial Management.** A Procurement and Contracts Management (PCM) Cell was created in the PIU to be responsible for the entire procurement cycle and for providing oversight to contracts management. The World Bank provided capacity support and training to the PCM during project preparation. The Project Management Consultant (PMC) team to assist the PIU included a procurement and contracts management expert. A divisional accountant from the Finance Department/Accounts and Treasury was deputed for the Project and a Financial Management Specialist was hired on a contract basis to provide support on FM.

B. KEY FACTORS DURING IMPLEMENTATION

47. The key factors that affected project implementation were:

- a. Difficulties in finding experts to work in Mizoram, because of its remoteness and lack of development.
- b. Weak performance of the Project Management Consultant (PMC), which resulted in the termination of the contract and loss of implementation time until the PMC was replaced by individual consultants.
- c. The COVID-19 pandemic affected implementation during the final stages of the project. The impact was minimized through careful adherence to Gol/GoM safety measures.
- d. Declaration of the Lunglei to Tlabung Road as a National Highway (NH) by MoRTH, which reduced the length of the project corridors from 90.7 Km to 77.7 Km. In addition, the regional integration benefits will be fully available upon the completion of this section outside the project.
- e. The three road contracts were delayed for a variety of reasons, including financial issues of the contractors, delays in obtaining clearances, and difficulties in sourcing construction materials for roads. The impact of the COVID-19 pandemic and civil unrest in the border areas exacerbated these delays.
- f. **Accidents.** There were two accidents in the C - Z Road and the C - C Road with four fatalities. Compensation was paid to the affected families in compliance with national and Bank requirements. The Bank India Country Director wrote to Gol requesting civil works to be immediately suspended and listed the actions to be taken to improve EHS and construction quality standards to ensure compliance. The corresponding actions were taken, and their on-going implementation was monitored by the Bank.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)



M&E Design

48. The M&E design included two PDO level indicators (for reduced travel time in the project corridors and increased traffic in the project corridors) and three intermediate indicators (one for Component 1 and two for Component 2.) While the two PDO indicators helped to measure the transport elements of the PDO, they were not adequate to measure increased connectivity to the neighboring countries. The intermediate indicators, especially for Component 2, did not capture the outputs and achievements of the wide range of institutional development activities. The PAD identified the frequency of data collection with clearly defined responsibilities. The design included Progress Reports (PRs), Financial Monitoring Reports (FMRs) including the annual audit report, and Procurement Management Reports (PMRs), in addition to a strategic impact evaluation during the mid-term to allow for any adjustments to the activities. The Results Framework was not revised during implementation.

M&E Implementation

49. The PMC developed a web portal and mobile applications (apps) to monitor the progress of civil works and consultancies under each component. The PIU, PWD and the consultants implemented the M&E system as designed, through systematic data collection, analysis, and reporting. The PIU/PMC regularly prepared and shared quarterly reports and a newsletter (GSHP II LEADS), which highlighted progress, key events in the quarter, and messages from the PIU and Project Stakeholders in a reader-friendly format.

50. Regular Bank implementation support/ supervision missions monitored implementation progress and provided the necessary support to the project agencies. The results section of the implementation status and results reports (ISRs) and aide memoires recorded the progress towards achievement of indicator targets.

M&E Utilization

51. At the project level, a three-tier weekly meeting –at the PIU level, the PD level, and at the Secretary level - was held every Monday. Progress reports were also shared with the Minister periodically, and with the Bank on a quarterly basis. These reports provided the basis for project restructuring, the identification of loan savings and their subsequent utilization for addressing the impact of the COVID-19 pandemic through additional activities.

Justification of Overall Rating of Quality of M&E

52. The weaknesses in M&E design, highlighted above, result in the overall quality of M&E being rated Modest.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

53. Environmental Safeguards. At appraisal, OP/BP 4.01 (Environmental Assessment) and OP/BP 4.36 (Forests) were triggered. The Project was assigned environmental Category A, based on the anticipated significant impacts from the upgrading and rehabilitation of roads, including the removal of roadside trees as well as land acquisition and resettlement. Prior to appraisal, all safeguard documents - including the Environmental and Social Management Framework (ESMF), Environmental Impact Assessments (EIAs), Environmental



Management Plans (EMPs), Social Impact Assessments (SIAs) and Resettlement Action Plans (RAPs)- were finalized in line with World Bank requirements and were disclosed.

54. The project demonstrated effective environmental management and implementation, both in construction sites and in camps. Environmental management measures implemented in all contract packages included debris & waste disposal, cleaning of natural drains along the project roads, protection of culverts and bridges, display of signage at construction sites, rehabilitation of borrow areas, compensatory plantation, tree saving, and photovoltaic street lighting; ground water recharge structures; road safety at construction sites by using delineators with retro reflective tapes, cones, informational & warning signages; well ventilated accommodations, clean drinking water and sanitation (toilets and bath rooms) in camps; gas cylinders for cooking food for workers, HIV/AIDs prevention measures, electrical safety at plants/camps by providing earthing, insulation mats, and danger signage; acoustic enclosures & chimneys at generator sets, solid waste management, and dust suppression on roads under construction. Based on the information provided by the PWD, 76 percent of the 122 dump sites operated in the three contract packages have been closed and 62 percent have been handed back to the owners with their consent. Safety of workers was ensured by providing high visibility vests, personal protective equipment (PPEs), safety signage, guards on machinery, and barricading of unsafe areas at camps sites. Training and capacity building of stakeholders was an important element of environmental management.
55. Several innovative best practices in environmental management were adopted by the contractors, including the provision of accommodation for workers with wind-operated turbine type ventilators and stoves using biofuels for cooking in campsites. Under the Road Sector Modernization Plan (RSMP), an Environmental and Social Engineering Cell has been setup and is currently operational.
56. Compliance with Environmental Safeguards is rated Moderately Satisfactory.
57. **Social Safeguards.** The project triggered OP/BP 4.10 on Indigenous People and OP/BP 4.12 on Involuntary Resettlement. A social assessment was carried out in compliance with OP/BP 4.12 and 4.10 and an Indigenous People Development Plan (IPDP) was prepared and implemented.
58. Land acquisition and resettlement were often slow due to the Resettlement Action Plans (RAPs) containing inaccurate information on land holdings, mismatches between road design drawings and field conditions, changes of alignment, delays in compensation negotiations and disbursements, and other aspects of the complex resettlement and rehabilitation (R&R) process. The Bank team provided detailed due diligence and followed-up through field visits. The project had disbursed 100 percent of compensation and provided R&R assistance to the Project Affected People (PAPs) as per the Entitlement Matrix. There are no pending wages and liabilities for the contractor's employees.
59. **Accidents.** There were two accidents in the C - Z Road and the C - C Road with four fatalities. The Bank Team provided guidance in ensuring that compensation was paid to the bereaved families as per the applicable Act. The fatal accident in April 2016 along the C-C road involved two workers of the Contractor and compensation was paid based on an out-of-court settlement; thereafter, the affected families withdrew the cases from the



Workmen's Compensation Committee. The second accident occurred in May 2017 along the C-Z Road and resulted in the death of two children. An out-of-court settlement was reached, and compensation was paid to the bereaved families.

60. Multiple rounds of discussions were held by the Bank with the project agencies on their failure to adequately implement agreed measures to improve Environmental and Social Health and Safety (ESHS) management systems and capacity. The Bank India Country Director wrote to GoI requesting civil works to be immediately suspended and provided a list of actions to be taken to improve EHS and construction quality standards to ensure compliance. The project hired a legal consultant to monitor compliance of all labor standards in the project sites. Reporting protocols and compliances required in the case of such accidents were put in place. Special orientation sessions were also held for the contractors. The PIU staff, along with the field engineers, as well as Bank staff, carried out joint inspections on the three roads to address project related grievances. In addition, monthly and quarterly progress reports with updated information on the GRM and compliance with labor standards were submitted by the PIU on a regular basis.
61. Compliance with social safeguards is rated **Moderately Satisfactory**.
62. **Financial Management (FM)**. The GoM FM system was used by the project in full compliance. The project's financial management performance was satisfactory throughout, and no significant issues were identified. The project was timely in the submission of quarterly IUFRRs, withdrawal applications, and internal and external audit reports. Internal audit findings and External Audit observations were addressed and resolved timely by the project. FM is rated Satisfactory.
63. **Procurement**. Procurement performance of the project was moderately satisfactory, taking into consideration the new contracting mechanisms developed and the types of complex procurement undertaken; however, these led to delays against the procurement timelines. There was market failure in several procurements, especially the Output and Performance based Road Contract (OPRC), the Road Safety TA, and the Road Safety civil works contracts, resulting in the need for retendering. Overall, sixteen consultancy contracts, twenty-one civil works contracts, and a few goods contracts were procured under the project.
64. STEP was used for monitoring procurement activities. Most of the procurement was grievance free, and the few complaints received were addressed and closed at the appropriate level. Overall, there was good competition. For innovative contracts, there were initial delays; however, once the bid documents were revised with wider stakeholder consultation, the procurements were successfully completed.

C. BANK PERFORMANCE

Quality at Entry

65. Key parameters, including strategic relevance, country context, lessons from other projects, and environmental and social development aspects, were adequately identified during project preparation and appropriately addressed. The project met the World Bank's fiduciary and safeguards requirements. Environmental and social



policies triggered were identified, the necessary assessments were prepared and included appropriate mitigation measures. The readiness of NCB contracts for bidding was helpful for the initial procurements to be completed in time and for initiating civil works in the early stages of the project. However, as discussed earlier the alignments of the corridors required adjustments. In addition, the M&E design had shortcomings.

66. The risk assessment carried out during project preparation rated the risks to be low during the design stage, and moderate during implementation. Mitigation measures adopted included early stakeholder consultations and coordination; creating public awareness of project roads; allowing adequate lead time for obtaining statutory clearances; preparation of specific manuals and market consultations for project procurement; and third-party monitoring and design review of detailed project reports (DPRs).
67. The task team worked closely with GoM to pilot the innovative OPRC contract, as well as for institutional strengthening and improving road safety management. It engaged in a dialogue with GoM on the financing strategy and network level maintenance for the state road network (including stakeholder consultations with the construction industry) and on bid documents. The difficulties and challenges faced by the construction firms and contractors were discussed and recorded. Market interest could have been studied more carefully to avoid the multiple procurement failures encountered during project implementation.

Quality of Supervision

68. The task team provided proactive guidance and support to the PIU and the PWD in identifying issues that impacted project implementation and recommended possible ways forward (especially in finalizing procurements, termination of contractors, retendering and repackaging of contracts, improving contractors' performance, and highlighting deficiencies in designs and in the quality of construction to improve project performance. Special measures were taken to ensure that qualified supervision staff were employed in the difficult conditions in Mizoram.
69. The Bank task teams conducted implementation support missions (ISMs) at an average of two missions per year for the first five years; these were supplemented by interim missions and technical visits. The impact of the COVID-19 pandemic resulted in virtual ISMs during 2020. The multi-disciplinary Bank teams reviewed all relevant documents, before, during and after ISMs. Land acquisition and utility shifting, procurement delays, stakeholder coordination and engagement issues were identified as they emerged. The Bank paid particular attention to ensuring compliance with fiduciary and safeguards requirements. Aide memoires, management letters and ISRs were prepared and issued after each mission timely, and highlighted progress and critical issues candidly, along with timelines for agreed actions. Action plans were prepared to speed up implementation and improve project performance, including compliance with safeguards and fiduciary requirements. Key implementation issues were regularly brought to the attention of GoM and Gol, as well as Bank management.
70. The May 2018 Mid-term Review (MTR) mission identified the need to: finalize design drawings for junctions at various locations, including at the starting point; design necessary engineering and bioengineering solutions to address slope failures along the side of the road; review the design of two proposed culverts with high



embankments; and address the issues of unauthorized buildings/ warehouses along the road corridors. The MTR mission provided suggestions to address these issues, which the PIU made efforts to implement.

71. Project restructuring was carried out to extend the closing date to complete remaining activities. The Bank worked with GoI/GoM to cancel savings of US\$1.34 million from the credit to contribute to GoI's efforts to address the impact of the COVID-19 pandemic. However, the Bank could have determined additional savings for cancellation, instead of leaving them unutilized at the time of credit closing.
72. The extended road maintenance periods in the contracts will enable GoM to continue regular operation under the on-going contracts. The on-going adoption of the institutional strengthening actions will contribute to better operational capacity, policy and planning, and knowledge building. The task team ensured that transition arrangements were in place for ongoing activities at project closing. These include the improvement and upgradation of C - C Road to two lane NH Standard; and the closing of final accounts for the civil works of T -K Road and C -Z Road.

Justification of Overall Rating of Bank Performance

73. Based on some of the weaknesses in quality at entry noted above, Bank performance is rated Moderately Satisfactory.

D. RISK TO DEVELOPMENT OUTCOME

74. GoM is committed to completing the non-project activities that are important to fully achieve the regional connectivity objective. The Bank will coordinate with Bangladesh on the completion of the activities on the Bangladesh side of the side of the border to ensure that the full benefits of the project corridors are achieved. However, the timely completion of these activities is contingent on early recovery of both Mizoram/ India and Bangladesh from the COVID-19 pandemic.
75. The Mizoram State Roads and Bridges Development and Maintenance Policy and the Institutional Strengthening Plan to Implement Road Sector Policy have been approved by GoM. Training centers and research institutions/center of excellence have been established and several trainings have been carried out. These are expected to sustain the institutional and capacity building initiatives under the project.
76. The sustainability of the road assets created under the project over the medium term is addressed by the maintenance periods (ranging from three to ten years) included in the priority corridor contracts. There is, however, a risk that GoM may not provide adequate budgetary allocations for road maintenance, given the fiscal constraints caused by the COVID-19 pandemic, as well as the current priority of the state (as well as that of donors who provide support to the state) on logistics and climate resilience.



V. LESSONS AND RECOMMENDATIONS

77. The main lessons from the project which could help in the design and implementation of future projects are:

- a. **Application of bioengineering solutions to protect against landslides and enhance resilience.** One of the project's major achievements was the successful piloting work on the hilly areas by applying bioengineering solutions for side slope stabilization and prevent landslides as a cost-effective and environmentally friendly manner. The project also rehabilitated about 120 disposal sites and closed dump sites using various bioengineering techniques. Similar bioengineering techniques should be considered in other road construction/ rehabilitation projects. The project has also provided drainage facilities in flood prone areas. These interventions enhance the resilience of the upgraded roads under the project.
- b. **Adoption of Standard Operating Procedures in construction during the pandemic.** In 2020, delays in construction related activities were noted during the nationwide lockdown due to the COVID-19 pandemic. The PIU issued strict guidelines to all contractors to adopt Standard Operating Procedures at construction sites to protect against the spread of COVID-19. This approach may be followed by other projects in the region that are impacted by the ongoing COVID-19 pandemic or similar future pandemics.
- c. **Policy and institutional development activities are essential to strengthen project implementation capabilities and for the sustainable management of road assets.** The project included several activities in this regard, see Efficacy section. Such activities should be considered for inclusion in the design of similar projects, keeping in mind the availability of consultants and the absorptive capacity of the project agencies.
- d. **Trade facilitation interventions, including the establishment of truck stops, are essential to enhance the provision of efficient handling and transportation services.** Truck stops built on regional connectivity roads contributed to enhancing cross-border supply chains/trade. Truck stops in future projects should be located close to border posts and/or wholesale markets/ processing facilities/packhouses/ warehouses and should include handling facilities (loading-unloading bays, container bays, and digital kiosks to provide e-warehousing and shipping/transportation services).
- e. **Type of contracts.** For construction at a remote place like Mizoram, item rate contracts result in conflicts between the contractors, engineers and employers. The EPC mode of contract may be considered for similar future projects in remote locations. Payments to contractors should be structured to avoid causing them liquidity issues.
- f. **Market Study for Contractors and Suppliers.** The remote location of Mizoram resulted in procurement delays as qualified contractors and suppliers of construction materials were not available. A careful market study during project preparation is essential in such circumstances to plan for project implementation.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: The proposed Project Development Objective is to increase transport connectivity along regional

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Reduction in travel time on project corridors	Minutes	293.00 13-Feb-2014	204.00 07-Dec-2021	204.00 14-Oct-2020	90.00 30-Apr-2021
L-T-K	Minutes	78.00 13-Feb-2014	54.00 07-Dec-2020	54.00 14-Oct-2020	15.00 30-Apr-2021
C-Z	Minutes	75.00 13-Feb-2014	52.00 07-Dec-2020	55.00 14-Oct-2020	30.00 30-Apr-2021
C-C	Minutes	140.00 13-Feb-2014	98.00 07-Dec-2020	90.00 14-Oct-2020	45.00 30-Apr-2021
Comments (achievements against targets):					



Due to the improvement of road condition and alignment on the project corridor the travel time in all the three corridors have reduced by an average of 60%, from the baseline of 293 minutes to 90 minutes on the completed road. This has mainly contributed to the immense improved road riding quality, better alignment and improved facility provided for the road corridors. It can be rightly said that due to these provided improved connectivity at the border region, for the people along the road corridor of TK and CZ road, access to the international boundary is a matter of a few minutes which is pliable by the even cars compared to the previous requirement of needed a 4-wheel drive vehicle during monsoon season with longer travel duration.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increase in traffic along project corridors	Number	3,456.00 13-Feb-2014	4838.00 07-Dec-2020	4,838.00 14-Oct-2020	2,416.00 30-Apr-2021
C-Z	Number	1,280.00 13-Feb-2014	1792.00 07-Dec-2020	1,792.00 14-Oct-2020	978.00 30-Apr-2021
L-T-K	Number	1,053.00 13-Feb-2014	1474.00 07-Dec-2020	1,474.00 14-Oct-2020	916.00 30-Apr-2021
C-C	Number	1,123.00 13-Feb-2014	1572.00 07-Dec-2020	1,572.00 14-Oct-2020	522.00 30-Apr-2021

Comments (achievements against targets):

The traffic in the project roads have increased since the implementation of the project, even before completion of the project. It is due to Covid-19 pandemic, restrictions of freight transport and passenger carrying public transports were restricted and the number of vehicles on all the road corridors has extensively reduce by more than 50% in Mizoram. However, since traffic count was not conducted before the pandemic the exact increase in traffic could



not be quantified for Chhumkhum to Chawngte road and Tlabung to Kawrpuichhuah road. For Champhai to Zokhawthar road since at the zero chainage, there is police check gate and all the traffic is being reported on a daily basis. The PIU is trying to collect the traffic count from the check post, which will reflect the actual volume of traffic along the C-Z corridor.

A.2 Intermediate Results Indicators

Component: Component A: Improvement of Priority Cross-border Roads and Trade-Related Infrastructure

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Roads rehabilitated, Rural	Kilometers	0.00 13-Feb-2014	91.00 07-Dec-2020	91.00 14-Oct-2020	77.70 30-Apr-2021

Comments (achievements against targets):

Component: Component B: Road Sector Modernization and Performance Enhancement through Institutional Strengthening

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Roads in good and fair condition as a share of total classified roads	Percentage	20.00 13-Feb-2014	30.00 07-Dec-2020	30.00 14-Oct-2020	35.00 30-Apr-2021
Size of the total classified	Kilometers	1015.00	1522.00	1,522.00	1,776.00



network					
Comments (achievements against targets):					
Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
District level road maintenance schemes implemented	Number	0.00 13-Feb-2014	5.00 07-Dec-2020	5.00 14-Oct-2020	5.00 30-Apr-2021
Comments (achievements against targets):					



B. KEY OUTPUTS BY COMPONENT

Component 1: Improvement of Priority Cross-border Roads and Trade-Related Infrastructure	
Key Outputs	1. 77.7 km Rural roads rehabilitated
Component 2: Road Sector Modernization and Performance Enhancement	
Key Outputs by Component	<ol style="list-style-type: none">1. 30% share of total classified roads are in in good and fair condition (5% increased)2. Five trade related infrastructure at CC, CZ and TK road in the form of market haats and truck stops constructed3. 12 road maintenance contracts implemented



ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Diep Nguyen-Van Houtte	Task Team Leader(s)
Ashok Kumar	Task Team Leader
Arnab Bandyopadhyay	Task Team Leader
Deepak Man Singh Shreshta	Task Team Leader
Anand Kumar Srivastava	Procurement Specialist(s)
Arvind Prasad Mantha	Financial Management Specialist
Mridula Singh	Social Specialist
Gopalswamy Srihari	Social Specialist
Sitarama Krishna Addepalli	Social Specialist
Drona Raj Ghimire	Social Specialist
Sangeeta Kumari	Social Specialist
Supervision/ICR	
Tesfamichael Nahusenay Mitiku, N. S. Srinivas	Task Team Leader(s)
Heenaben Yatin Doshi	Procurement Specialist
Sanjeet Kumar	Procurement Specialist(s)
Arvind Prasad Mantha	Financial Management Specialist
Aruna Aysha Das	Team Member
Dilshad Sultan Dossani	Team Member
Radha Narayan	Procurement Team
Payal Malik Madan	Procurement Team
Venkata Rao Bayana	Social Specialist
Pamela Patrick	Procurement Team



Asferachew Abate Abebe	Environmental Specialist
Tema Alawari Kio-Michael	Team Member

B. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
Preparation		
FY13	6.112	33,097.08
FY14	53.184	243,270.80
FY15	0	9,197.87
FY16	0	0.00
Total	59.30	285,565.75
Supervision/ICR		
FY14	0	6,597.84
FY15	21.962	96,892.45
FY16	25.805	112,729.36
FY17	30.562	146,372.66
FY18	13.626	119,539.41
FY19	23.910	138,092.84
FY20	24.414	142,156.77
Total	140.28	762,381.33



ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US\$M)	Revised Amount (US\$M)	Actual at Project Closing (US\$M)	Actual Disbursed
Component A: Improvement of Priority Cross-border Roads and Trade-Related Infrastructure	102.00	93.98	93.98	93.98
Component B: Road Sector Modernization and Performance Enhancement through Institutional Strengthening	5.00	4.51	4.51	4.51
Total	107.00	98.49	98.49	98.49



ANNEX 4. EFFICIENCY ANALYSIS

Ex-Post Economic Analysis

Republic of India: Mizoram State Roads II – Regional Transport Connectivity Project

1. The economic analysis of the project roads done during the preparation of the Mizoram State Roads II – Regional Transport Connectivity Project was carried out using the HDM-4 model. The model was used to estimate the Vehicle Operating Costs for traffic in each vehicle category on each selected road sections with and without improvement considering the speed and travel time including surface quality and road congestion. Each road was assessed separately before all are assessed as a package to obtain Economic Internal Rates of Return (EIRR) and net present values. The economic evaluation has been carried out for a 23-year time horizon including a three-year construction period in which the operation period after construction was 20 years and applying an opportunity cost of capital (discount rate) of 12 percent.
2. The ex-post economic analysis of the project roads done for the ICR was carried out with the same methodology and assumptions adopted on the ex-ante economic analysis, computing Vehicle Operating Costs savings derived from the project investments. The ex-post economic analysis was done by updating the flow of net benefits estimated at appraisal, considering the actual project roads length and the actual upgrading costs.
3. The table below presents the project roads length estimated at appraisal and the actual upgrading length. Overall, at appraisal 90.7 km were estimated to be upgraded under the project, however, only 77.7 km were upgraded⁴. The reasons for the shortfall of the actual length were explained under the Achievement of PDOs at Table 2.

Table 1: Project Roads Length (km)

Road Sections	PAD Estimated Length (km)	Actual Construction Length (km)
Champhai Zokhawthar Road	27.2	26.2
Tlabung – Kawrpuichhuah Road	22.0	11.3
Chhumkhum - Chawngte Road	41.5	40.2
Total	90.7	77.7

4. The table below presents the upgrading costs estimated at appraisal, the contract costs, and the actual cost. The total project upgrading costs estimated at appraisal were Rs 6,787 million, while the actual total costs are Rs 6,007 million.

⁴Lunglei - Kawrpuichhuah road was curtailed to Tlabung - Kawrpuichhuah during loan signing as Lunglei - Tlabung section was declared as National Highway by MoRTH. The reported 22 km at appraisal is for Tlabung – Kawrpuichhuah.

**Table 2: Upgrading Costs**

Road Sections	PAD Financial Cost Without Land Acquisition (Rs Million)	Contract Financial Cost Without Land Acquisition (Rs Million)	Actual Financial Cost Without Land Acquisition (Rs Million)
Champhai Zokhawthar Road	1,791	1,648	1,819
Tlabung – Kawrpuichhuah Road	2,438	785	991
Chhumkhum - Chawngte Road	2,558	2,784	3,197
Total	6,787	5,217	6,007

5. The table below presents the upgrading costs per km estimated at appraisal, the contract costs per km, and the actual cost per km. On average, the actual costs per km were 15 percent higher than the contract costs, and the actual costs were 3 percent higher than the ones estimated at appraisal, which is a small difference.

Table 3: Upgrading Costs per km

Road Sections	PAD Financial Cost Without Land Acquisition (Rs Million/km)	Contract Financial Cost Without Land Acquisition (Rs Million)	Actual Financial Cost Without Land Acquisition (Rs Million)	Actual per Contract (ratio)	Actual per PAD (ratio)
Champhai Zokhawthar Road	65.86	62.90	69.42	1.10	1.05
Tlabung – Kawrpuichhuah Road	110.81	69.48	87.70	1.26	0.79
Chhumkhum - Chawngte Road	61.65	69.25	79.53	1.15	1.29
Total	74.83	67.14	77.31	1.15	1.03

6. The project PAD does not present the estimated the traffic growth rate adopted for the ex-ante economic analysis, thus it was not possible to compare the actual traffic growth observed on the project roads⁵ with the appraisal estimates.

7. The table below present the ex-ante EIRRs estimated at appraisal and the ex-post EIRRs computed for the ICR. The overall ex-ante project EIRR was 17.0 percent, while the overall ex-post EIRR is 17.2 percent, confirming the good economic justification of the project.

Table 4: Ex-Post Economic Evaluation Results

Road Sections	PAD EIRR (%)	Ex-Post EIRR (%)
Champhai Zokhawthar Road	16.4%	15.9%
Lunglei – Kawrpuichhuah Road	15.5%	18.2%

⁵ There is very limited actual traffic data on the project roads. The traffic data from 2019 seems to indicate that the actual traffic growth on the project roads was almost nil.



Chhumkhum - Chawngte Road	20.9%	17.7%
Total	17.0%	17.2%

8. A sensitivity analysis assuming that the project benefits are 20 percent lower than the appraisal estimates, to account for the low actual traffic growth rates on the project roads, brings the overall project EIRR to 14.8 percent, which remains satisfactory.

9. The table below presents the ex-ante NPVs estimated at appraisal and the ex-post NPVs computed for the ICR, at 12 percent discount rate. The overall ex-ante NPV was US\$ 57.4 million, while the overall ex-post NPV is US\$ 45.5 million.

Table 5: Ex-Post NPV Results

Road Sections	PAD NPV (USD million)	Ex-Post NPV (USD million)
Champhai Zokhawthar Road	12.3	10.4
Lunglei – Kawrpuichhuah Road	8.4	8.7
Chhumkhum - Chawngte Road	36.8	26.4
Total	57.4	45.5



ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS



ANNEX 6. SUPPORTING DOCUMENTS (IF ANY)

Disclosable Restructuring Paper - Mizoram State Roads II- Regional Transport Connectivity Project, October 2020

- Implementation support and reporting (ISR) - Mizoram State Roads II- Regional Transport Connectivity Project, November 2014 to April 2021
- Project Agreement for Credit (Closing Package), August 2014
- Project Appraisal Document Mizoram State Roads Regional Transport Connectivity Project-II, April 2014
- Project Information Document (Concept Stage) - Mizoram State Roads II- Regional Transport Connectivity Project, September 2013
- Second Mizoram State Roads Regional Transport Connectivity Project: Resettlement and indigenous peoples development plan of C-Z and C-C road, February 2014
- Second Mizoram State Roads Regional Transport Connectivity Project: environmental assessment: Environmental management plan, February 2014
- Second Mizoram State Roads Regional Transport Connectivity Project: environmental assessment: Environmental impact assessment, February 2017
- Second Mizoram State Roads Regional Transport Connectivity Project: environmental assessment: Final environmental management framework, February 2014
- Second Mizoram State Roads Regional Transport Connectivity Project: environmental assessment: Environmental management plan: widening to two-lane, re-alignment and geometric improvement of Champhai-Zokhawthar road, February 2017
- Second Mizoram State Roads Regional Transport Connectivity Project: executive summary, January 2014
- Supplemental Letter Ref. Performance Monitoring Indicators for Credit (Closing Package), August 2014



ANNEX 7: Status of Mizoram’s Institutional Development Achievements vis-à-vis the Indian Road Sector Modernization Strategic Framework

Strategic Framework	MRCP’s Achievement and Gaps
<p>Element 1: Policy & Planning</p> <ul style="list-style-type: none"> -Road sector policy -Integrated masterplan -Prioritize core road network -Network Data (Inventory, Condition, Traffic, Safety) -Resilience, Resource Efficiency, Sustainability 	<p>Achievements</p> <ul style="list-style-type: none"> Transport policy drafted Road network data collected by the Mizoram Road Asset Management System (RAMS), and maintenance and investment plan prepared to enhance resource efficiency and ensure sustainability Bioengineering solutions applied to enhance resilience of hill roads <p>Areas for future improvement</p> <ul style="list-style-type: none"> Preparing multimodal integrated transport masterplan, including agricultural supply chain and cross-border connectivity Establishing a planning platform to promote integrated development of transport infrastructure, services, and logistics Green transport and logistics policy
<p>Element 2: Adequacy of Funds</p> <ul style="list-style-type: none"> -Financing Plan -Increased budget from finance ministry (based on RMS) -PPPs (including Toll Policy) -Dedicated funding (Funding streams, Professional management) - Ability to raise funds commercially -Integrated construction and maintenance contracts 	<p>Achievements</p> <p>Road financing mechanism established</p> <p>Gaps</p> <ul style="list-style-type: none"> Operationalizing the road financing mechanism Increasing budgetary allocation Attracting private investment for establishing and operating logistics facilities and services
<p>Element 3: Efficiency of Expenditures</p> <ul style="list-style-type: none"> -RMS- data driven decision & priorities -Moving from annual maintenance through bigger and longer contracts (OPRC) -For capex: Less of input-based contracts to design-build EPC to PPPs - Governance: e-procurement & transparency, enhancing competition and efficiency in contracting, ICBS 	<p>Achievements</p> <ul style="list-style-type: none"> RAMS has delivered maintenance and investment plan Competitive tendering in place <p>Areas for future improvement</p> <ul style="list-style-type: none"> Developing/adapting Electronic Project Management System (ePMS) Promoting performance-based maintenance contracting
<p>Element 4: Implementation Capacity</p> <ul style="list-style-type: none"> -Vision & programmatic approach - Corporation for operational/HR flexibility -Small item-rate to EPC, OPRC, PPPs -Project and Financial Management Systems - Training, institutional strengthening, MIS, processes -Stakeholder Engagement 	<p>Achievements</p> <ul style="list-style-type: none"> Training to PWD staff provided <p>Areas for future improvement</p> <ul style="list-style-type: none"> Strengthening PWD and Department of Transport (DOT), and establishing Infrastructure Development Finance Corporation to attract private financing Developing vision and Human Capital development strategy



<p>Element 5: Safety</p> <ul style="list-style-type: none">-Policy and strategy- Institutions – lead agency-Funding-Data and analytics-Multisectoral investment program- Health, Transport Police, Works, Education	<p>Achievements</p> <p>Road Safety Cell established</p> <p>Areas for future improvement</p> <p>Promoting “The Safe System”</p> <p>Enhancing the role of DOT</p>
<p>Element 6: Logistics and Services</p> <ul style="list-style-type: none">-Warehouses, markets, logistics centers, reefers-Facilitating efficient competitive services	<p>Achievements</p> <p>Truck stops establishment introduced</p> <p>Market infrastructure upgrading supported</p> <p>Areas for future improvement</p> <p>Conducting supply chain analysis and promoting green and innovative logistics solutions</p> <p>Establishing freight consolidation platforms, including collection points (Origin for agricultural freight) serving cluster of farms within 2km radius, and freight terminals (Destination for agricultural freight) serving agricultural produce wholesale markets, processing facilities, warehouses, packhouses.</p>



ANNEX 8. Photos of Project Achievements

Project Achievements along the Chhumkhum-Chawngte (C-C) Road



CC Road Market Shade at Rangte



Bazar Shed & Waiting Shed at CC Road

Project Achievements along the Champhai-Zokhawthar (C-Z) Road



**Box Culvert with Geo Cell Embankment
at Ch: 21+74**



**Box Culvert with High Embankment Geo Cells and
GeoGrids at Ch: 21+745 km**



Road Marking at Zotlang Village CZ Road



Mualkawi Bypass along CZ Road

Project Achievements along the Tlabung-Kawrpuchhuah (T-K) Road



TK Road at Ch: 0+400 Km



TK Road at End Stretch