Internal Ex-Post Evaluation for Technical Cooperation Project

conducted by Myanmar Office: September, 2019

Country Name	**Project for Improvement of Road Technology in Disaster Affected Area**
The Republic of the Union of Myanmar	

I. Project Outline

Background	Road structure in Myanmar was vulnerable to inundation. Especially, because of its location near the coastal area, the people in Ayeyarwady Region had high risks of suffering the damage from natural disasters. However, only the uniformed technical standard was applied for the road construction in all areas of Myanmar without considering the special characteristics in each area, such as soft-ground road, since the area-specific technique was not available. In addition, the technical level of engineers engaged in the construction was not sufficient because they were trained only in the basic skills and knowledge at a training center. Therefore, in order to secure the roads throughout the year in Ayeyarwady Region, it was essential to develop the technical standards of road construction with consideration of the area's characteristics as well as the aspect of long-term maintenance, and to improve the technical capacities of those engineers.		
Objectives of the Project	Through development of standards and manuals of road technology and implementation of pilot projects to enhance the practical skills and knowledge of the road technical staff, the project aims to enhance the capacity of the Public Works (PW) under the Ministry of Construction (MOC) for road construction adaptive to the delta areas of Ayeyarwady Region, thereby improving the roads of those areas. 1. Overall Goal: Roads in the delta areas of Ayeyarwady Region are improved. 2. Project Purpose: The capacity of the Public Works (PW) for road construction adaptive to the delta areas of Ayeyarwady Region is enhanced.		
Activities of the Project	1. Project Site: Delta areas of Ayeyarwady Region 2. Main Activities: (1) Review current manuals and specify the standards of road technology; Develop manuals and reflect the outcome of the pilot projects; Disseminate the manuals through seminars and workshops. (2) Formulate and implement the pilot projects (PP-1 and PP-2); Train road technical staff throughout the pilot projects; Conduct workshops and seminars to share the outcomes. 3. Inputs (to carry out above activities) Japanese Side 1) Experts: 13 persons (3 long term+10 short term) 2) Trainees received: 13 persons 3) Equipment: soil mixing plant, boring machine, pore water pressure, inclination gauge, data logger, etc. Myanmar Side 1) Staff allocated: 13 persons 2) Land and facilities: Project Office 3) Local cost: Costs for pilot projects, etc.		
Project Period	July 2012 – June 2015	Project Cost	(ex-ante) 370 million yen, (actual) 393 million yen
Implementing Agency	Public Works (PW) of Ministry of Construction (MOC) (Department of Highways (DOH), Ministry of Construction (MOC) since April 1, 2015)		
Cooperation Agency in Japan	Pegasus Engineering Corporation, Oriental Consultants Global Co., Ltd.		

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

Evaluating Achievement Status of Overall Goal (Target Year for Overall Goal)

・ In the Ex-Ante Evaluation Sheet, the target year for Overall Goal is set as three years after the project completion, which is June 2018.

1 Relevance

<Consistency with the Development Policy of Myanmar at the Time of Ex-Ante Evaluation and Project Completion>

At the time of ex-ante evaluation, this project was consistent with the development policy of Myanmar, namely the "3rd Five Year Road Development Plan (2011/12-2015/16)" under "The 30-Year Road Development Plan for 2001 to 2030," by which the construction and improvement of 10 road sections in Ayeyarwady Region were stipulated. At the time of project completion, the above development policy was still effective.

<Consistency with the Development Needs of Myanmar at the Time of Ex-Ante Evaluation and Project Completion >

At the time of ex-ante evaluation, this project was consistent with Myanmar's development needs to improve the technical standards of road construction and to enhance the capacity of engineers as described in "Background" above. At the time of project completion, there were continuing needs for road construction and maintenance.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The government of Japan set its policy to assist Myanmar focusing on the sectors that would directly contribute to the improvement of daily lives for the people under the three priority areas[1]. One of them was the assistance toward the infrastructure development needed for the sustainable economic development.

<Evaluation Result>

In light of the above, the relevance of the project is high.

2 Effectiveness/Impact

[1] ODA Data Book 2012

<Status of Achievement of the Project Purpose at the time of Project Completion>

By the end of the project completion, the project achieved its purpose: "The capacity of the Public Works (PW) for road construction adaptive to the delta areas of Ayeyarwady Region is enhanced." Through hearings at the time of project completion, 41 out of 50 PW staff (82%) responded that the engineers' skills and knowledge for road design and construction were enhanced. (Indicator 1). Throughout the two pilot projects, the roads with the total length of 2.2 km were constructed by applying the technology introduced by the project, achieving 85% of the target length (Indicator 2).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

After the project completion, the project effects have continued. The knowledge and skills of engineers have been further enhanced after the project completion by training courses provided by the Central Training Center (CTC) and the Mechanical Training Centers (MTCs). According to the DOH (previously known as PW), the manuals developed by the project were well utilized and knowledge-sharing among engineers was continued. Furthermore, the roads with the length of 91.77 km have been additionally constructed in delta areas of Ayeyarwady Region with the soft soil treatment and stabilization technique introduced by the project.

<Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

It is observed that the Overall Goal, i.e. "Roads in the delta areas of Ayeyarwady Region are improved," has been achieved. As mentioned above, the total length of roads improved by the stabilization technique reached 93.97 km which includes 2.2 km constructed by two pilot projects (Indicator 1). By the target year (2018), the driving hour on the Route 10 (from Bogale to Mawgyun for 110.5 km) was reduced by 9.0% throughout the year, compared with what was before the project, thereby achieving 90% against the target (ratio of reduction as10%) (Indicator 2). The driving hour on the Route 10 has further reduced to 11.3% at the time of ex-post evaluation.

<Other Impacts at the time of Ex-post Evaluation>

Some ripple effects were identified during the ex-post evaluation study. The technology was applied to roads located outside of the target areas, such as the Yangon-Mandalay Expressway and other roads in Yangon Region. Furthermore, it was identified by the interviews that the technologies served to encourage female engineers to engage in the practical work after they learned the soft soil treatment and the stabilization method during the pilot projects.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of Project Purpose and Overall Goal

<table>
<tr><th>Aim</th><th>Indicators</th><th>Results</th></tr>
<tr><td>(Project Purpose)
The capacity of the Public Works (PW) for road construction adaptive to the delta areas of Ayeyarwady Region is enhanced.</td><td>Indicator 1:
The enhancement of skill and knowledge of the engineer for road design and construction is confirmed by the hearing from more than 30 staff.</td><td>Status of the Achievement: achieved (continued)
(Project Completion)
The cumulative total of 409 engineers including other staff of PW were trained through a series of seminars, workshops and on-the-job training during the two pilot projects. The management level of PW and most of the engineers considered that those seminars and training were very useful and favorable. Through hearings at the time of project completion, among 50 PW staff, 41 staff (82%) responded that the engineers received sufficient knowledge (34%) or some knowledge (48%) and only 9 staff (18%) responded negatively
(Ex-post Evaluation)
Though no data on hearing of staff was obtained, it was identified through the ex-post evaluation study that after the project completion, the knowledge and skills of engineers had been further enhanced through annual training courses provided by the CTC and MTCs as listed in the table below. According to the DOH, the manuals developed by the project, including "Textbook for Practical Training about Checking Methods for Stability & Settlement of High Embankment on Soft Ground," have been well utilized, and knowledge-sharing among engineers has been continued.
List of Training Courses conducted annually
<table>
<tr><th>Training Center</th><th>Purpose of training</th><th>Frequency</th><th>No. of participants</th></tr>
<tr><td rowspan="2">CTC</td><td>Upgrading the technical level for Junior Engineer (Soft soil treatment and Stabilization)</td><td>4 times/year</td><td>200
(50 persons/time)</td></tr>
<tr><td>Upgrading the technical level for Staff Officer (Soft soil treatment and Stabilization)</td><td>2 times/year</td><td>100
(50 persons/time)</td></tr>
<tr><td>MTC, North</td><td rowspan="2">Practical training only on machine operation such as Stabilizer and Soil plant etc.</td><td>4 times/year</td><td>160
(40 persons/time)</td></tr>
<tr><td>MTC, South</td><td>4 times/year</td><td>160
(40 persons/time)</td></tr>
</table>
</td></tr>
</table>

Indicator 2:
By the end of the project, road length constructed by the technology introduced from Pilot Project is extended longer than 2.6km.

Status of the Achievement: achieved (continued)
(Project Completion)
Total Length of the Sections Paved by Applying the Technology (lime stabilization method)

Pilot Project	Length of road (km)	Ratio against target of 2.6 km (%)
Pilot Project 1 (Feb. 2014 – Jun. 2014)	1.6	62%
Pilot Project 2 (Feb. 2015 – Jun. 2015)	0.6	23%
Total	2.2	85%

(Ex-post Evaluation)
List of Roads Improved after the Project Completion by Applying the Technology (in the delta areas of Ayeyarwady Region)

	Name of Road	Length	Year
1	Bogalay-Mawlamyinekyune-KywinMaNgway-Warkhayma Road (including the Route 10 partly constructed under the Pilot Project 2)	0.40 km	2015-16
2	Maubin-Kyikelatt-Pyarpon Road (ADB-assisted project)	54.50 km	2015-17
3	Bogalay-Satsan-Htawpaing-Amar Road	18.00 km	2016-17
4	Htantapin-Lamutaw-Kyutaw Road	12.87 km	2016-17
5	Pyarpon-Bogalay Road (assisted by Japan Infrastructure Partners)	6.00 km	2017-18
	Total	91.77 km	

(Overall Goal)
Roads in the delta areas of Ayeyarwady Region are improved.

Indicator 1:
The road improved by the stabilization technique is more than 10 km.

(Ex-post Evaluation) achieved
Total Length of Roads Improved by Stabilization Technique in delta areas in Ayeyarwady Region

year	During project	After project completion					Total
		2015	2016	2017	2018	2019	
Road lengths improved (km)	2.2	54.9	30.87	6.00	NIL	NIL	93.97

Indicator 2:
Driving hour or travelling time is reduced 10% comparing before execution of project.

(Ex-post Evaluation) achieved
Travelling Time (Hour) and its Ratio of Reduction (⊿%)

Road section \ Year		Before the project 2011	Project Completion 2015	1 year after the project completion 2016	2 years after the project completion 2017	Target year 2018	Ex-post Evaluation 2019 As of Aug.
Route 10 (1)	Rainy season	6.67	6.58	6.50	6.25	6.17	6.00
			⊿1.3%	*⊿2.5%*	*⊿6.3%*	*⊿7.5%*	*⊿10.0%*
	Dry season	4.00	3.83	3.75	3.67	3.58	3.50
			⊿4.3%	*⊿6.3%*	*⊿8.3%*	*⊿10.5%*	*⊿12.5%*
	In average		*⊿2.8%*	*⊿4.4%*	*⊿7.3%*	*⊿9.0%*	*⊿11.3%*

Note:
(1) Route 10 (from Bogale to Mawgyun for 110.5 km) was partly constructed during the Pilot Project 2

Source: Terminal Evaluation Report, Project Completion Report, Implementation Program on Pilot Project, Completion Report on Pilot Projects, and Interviews with DOH officers

3 Efficiency

While the project period was within the plan, the project cost slightly exceeded the plan (ratio against plan: 100% and 106%, respectively). The Outputs of the project were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

The Government of Myanmar has been advancing the road construction and development based on "The 30-Year Road Development Plan for 2001 to 2030." MOC is implementing the "Road Development Master Plan (2016-2030)" under the "National Transport Master Plan (2016)" with the support of JICA. Both plans prioritize the road construction and improvement of road network for national development.

<Institutional Aspect>

Since the organizational reform in April 2015, the DOH under MOC has been responsible for road construction, and the Department of Bridge (DOB) for bridge construction. MOC has assigned sufficient manpower to progressively carry out the road improvement in each state and region according to the road development plan. If there are internal transfers among departments or regions, MOC assigns other staff in the vacant posts without delay. As for the training institutions, the CTC and MTCs have constantly organized training annually with enough trainers and staff.

<Technical Aspect>

All counterparts of the project have remained to engage in the road improvement work and have contributed to maintain the technologies acquired through the project. It was confirmed by the interview with DOH officials and site visit that major equipment for road construction provided by the project have been well utilized and maintained by DOH. As mentioned in Indicator 1 of Project Purpose, there is regular training available for engineers at CTC as well as MTCs in order to maintain the necessary technical level as described above.

<Financial Aspect>

According to the financial information obtained from the DOH, it is confirmed that the budget allocation for road construction nationwide has been in the increasing trend up to 2017. Among the 17 states/regions, Ayeyarwady Region secured 11.0% to 14.3% of the

total budget in the financial year in 2016 and 2017 respectively. Though the figure of FY2018 is not available, it was confirmed by the interview with the DOH that they have sufficient financial resources to improve and maintain the road condition by applying the technology introduced by the project.

(Currency Unit: Kyat in million)

Items	FY 2015	FY 2016	FY 2017	FY2018
Budget allocation for Road Construction to 17 states/regions combined	128,765	135,259	194,830	NA
Budget allocation to Ayeyarwady Region alone	14,498	14,873	27,877	NA
(ratio against the total budget amount)	*(11.35%)*	*(11.0%)*	*(14.3%)*	*NA*

The CTC and MTCs secured the sufficient budget to continue to provide the training courses on the road construction technologies, as shown in the below table.

(Currency Unit: Kyat in million)

Items	FY 2015	FY 2016	FY 2017	FY2018
Total Budget of Central Training Center (CTC)	272.0	315.0	501.0	NA
Total Budget of Mechanical Training Centers (MTCs) (North and South combined)	29.7	27.8	28.9	NA

Source: Interview with DOH Officials, Survey report of need survey on enforcement of CTC function

<Evaluation Result>

In light of the above, no problem has been observed in terms of the policy, institutional, technical and financial aspects. Therefore, the sustainability of the effects through the project is high.

5 Summary of the Evaluation

The project achieved the Project Purpose of enhancing the capacity of the Public Works (PW) for road construction adaptive to the delta areas of Ayeyarwady Region. The effects of the project have continued after the project completion, and the Overall Goal of improving the roads in the target areas has been achieved. As for the sustainability, no problems have been observed in terms of the policy, institutional, technical and financial aspects. As for the efficiency, the project cost slightly exceeded the plan.

Considering all of the above points, this project is evaluated to be highly satisfactory.

III. Recommendations & Lessons Learned

Lessons Learned for JICA:

In technical cooperation project, it is very useful to develop manuals and to make them referable for those concerned. Effective utilization of those manuals, one of tangible project assets, contributes to the continuous enhancement of the technologies after the project completion. By effectively providing the knowledge-sharing opportunities among engineers on a timely basis, manuals can even serve to enhance the technical levels of those engineers not involved in the project. According to the DOH, the manuals on soft ground treatment developed by the project have been well utilized, and thus knowledge-sharing among engineers has been continued.

Picture

Local people enjoy the benefits of road constructed with new technologies introduced by the Project

The technology is disseminated to engineers periodically at Central Training Center (CTC)