Country Name Republic of Philippines		Improvement of Quality Management for Highway and Bridge Construction and Maintenance (Phase I and II)					
I. Project Outline	ines	(1 hase 1 and 11)					
Background	According to the inventory survey conducted by the Department of Public Works and Highway (DPWH) in December 2009, the proportion of the paved national roads in the total length was approximately 70% but about 30% of the paved national roads needed repair and rehabilitation due to cracks of pavements. While DPWH aimed at the proportion of the paved national road of 95%, further enhancement of road and bridge maintenance system was an urgent issue for DPWH. In particular, it was essential to strengthen technical capacity of the regional office staff and to establish a maintenance cycle composed of a series of activities including inspection planning inspection, inspection evaluation and repair works.						
Objectives of the Project	Thr mainter manual aimed a mainter engined <phase 1. Ove cons 2. Proj man imp</phase 	ough trainings on quality m nance management and bridge s and guidelines as well as impr at enhancing capability of engin nance management of roads/br ers in other regions. I & II> rall Goal: Capability of DPWH truction and maintenance and m ect Purpose: Capability of engin agement of road/bridge constru- roved in the pilot regions.	anagement of r maintenance ma ovement of mana eers of DPWH an idges, thereby c I and Regional (aintenance manag eers of DPWH, R action and mainte	nager gemen od the ontrib Offices gemen egion enance	al Offices and district engineering offices on quality es and maintenance management of road/bridge is		
Activities of the Project	Ce 2. Ma <ph: and <ph: Slop as w Man 3. Inf Japanes <phase 1) E: 2) Tr 3) Tr 4) Ec M 5) Of ac <phase 1) E: 2) Tr 3) Tr 10 4) Ec Mase 1) E: 2) Tr 3) Tr 10 5) Of ac 2) Tr 3) Ec and 3) Ec and 3) Ec and 3) Ec and 3) Ec and 3) Ec and 3) Ec and 3) Tr 10 3) Tr 10 4) Ec and 3) Tr 10 4) Ec and 3) Tr 10 4) Ec and 3) Tr 10 5) Of 10 5 7 7 7 8 7 7 7 7 8 7 7 7 8 7 7 7 7 8 7 7 8 7 7 8 7 7 8 8 7 8 7 8 7 8 7 8 7 8 8 8 8 7 8 7 8</phase </phase </ph: </ph: 	ntral Visayas Region (Region VI an activities: ase I> i) Development and delive maintenance), ii) Formulation of ase II> i) Establishment of road/ e Management System (RSMS) vell as trainings in CAR and R agement System (BMS) and imports (to carry out above activities be Side I> cperts from Japan: 15 persons aining in Japan: 6 persons aining in the third country donesia): 9 persons puipment: Clinometers and Lase eters, etc. peration cost: Travel cost, co ministration cost for the regiona II> cperts from Japan: 11 persons aining in Japan: 22 persons puipment: Office equipment, if d equipment, etc.	II), and Davao Rep ery of training pro- function of training pro- function of training pro- function of training pro- bridge maintenan- and improvement egion VII, iii) D provement of RM (Vietnam and provement of RM (Vietnam and pro-Type Distance st for vehicles, l offices, etc.	gion (grams s on r ce ma t of R evelop MM a Phili <pha 1) 2) 3)</pha 	 a), Cordillera Administration Region (Region CAR), Region XI) b) so on quality management of road/bridge construction and maintenance nagement cycle, ii) Promotion of utilization of Road outine Maintenance Management Manual (RMMM) oment of engineering inspection manual on Bridge is well as trainings in Region VII and Region XI b) staff allocated: 21 persons c) Land and facilities: Office spaces in DPWH and the three model Regional Offices c) Operation cost: cost for the pilot projects, cost for the project staff ase II> Staff allocated: 56 persons c) Land and facilities: Office spaces in the three model Regional Offices c) Operation cost: cost for project implementation 		
Project Period	<phase Februar <phase< td=""><td>ry, 2007 – February, 2010</td><td>plementation Project Cost</td><td>(ex-a <pha< td=""><td>ase I> ante) 350 million yen (actual) 498 million yen ase II> ante) 350 million yen (actual) 439 million yen</td></pha<></td></phase<></phase 	ry, 2007 – February, 2010	plementation Project Cost	(ex-a <pha< td=""><td>ase I> ante) 350 million yen (actual) 498 million yen ase II> ante) 350 million yen (actual) 439 million yen</td></pha<>	ase I> ante) 350 million yen (actual) 498 million yen ase II> ante) 350 million yen (actual) 439 million yen		
Implementing	<phase< td=""><td>I and Phase II></td><td></td><td></td><td></td></phase<>	I and Phase II>					
Agency Cooperation Agency in Japan	<phase< td=""><td>nent of Public Works and Highw I> Ministry of Land, Infrastruct II> Nippon Engineering Consul</td><td>ure, Transport and</td><td></td><td>ism a Engineering International, Hanshin Expressway</td></phase<>	nent of Public Works and Highw I> Ministry of Land, Infrastruct II> Nippon Engineering Consul	ure, Transport and		ism a Engineering International, Hanshin Expressway		

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

[Evaluation of the Project Purpose and the Overall Goal and the envisaged logic for achieving and sustaining the project effects]

The following issues should be considered in order to evaluate the achievement level of the Project Purpose and the Overall Goal of the two projects.

Phase I: The indicator 1 of the Project Purpose is overlapped with the indicator of the Output 1. The indicator 3 of the Project Purpose is not relevant due to no activity to establish training system.

Phase II: The indicators of the Project Purpose used by the terminal evaluation were different from the ones in the revised project design matrix (ver.3) but there was no explanation about reasons why the terminal evaluation team used different indicators. Therefore, while the information and data at the time of terminal evaluation are used for the ex-post evaluation, the verifiable indicators for the Project Purpose and the Overall Goals for the Phase II are based on the PDM ver.3

Therefore, in the ex-post evaluation, the two projects are interpreted as one intervention, and the Project Purpose and Overall Goal were restructured to verify achievement levels and continuation of the effects.

1 Relevance

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

The project was consistent with the development policies of the Philippines prioritizing maintenance and rehabilitation roads and bridges in the "Medium-term Development Plan" (2004-2010 and 2011-2016) and "Medium-term Program" (2005-2010 and 2011-2016) of DPWH and those policy priorities had not changed throughout the project periods.

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

The project was consistent with the development needs of the Philippines for proper maintenance and repair of roads and bridges in order to improve the service level and to reduce repair cost as well as to extend the lifetime of the road infrastructure for sustainable development of the country. The development needs had not changed throughout the project periods.

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

The project was consistent with the Japan's ODA Policy to prioritizing support for "enhancement of economic structure for sustainable growth and overcoming of constraints on growth" in the "Country Assistance Program" (2000). <Evaluation Result>

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

2 Effectiveness/Impact

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

The restructured Project Purpose for the Phase I and Phase II was achieved. The technical methods and quality control required by the technical manuals and guidelines have been utilized (Indicator 1). In terms of the number of defects repaired (Indicator 2), there were 6 cases of road repair and 12 cases of bridge repair under the Phase I. Also, 2 pilot projects for road maintenance and 8 pilot projects for bridge maintenance were conducted under the Phase II. In terms of proposing and taking the necessary countermeasures (Indicator 3), damages on bridges were properly diagnosed and the most proper measures were taken to fix the damages under the Phase I. Under the Phase II, the conditions of the target roads and bridges were improved through implementation of the pilot projects.

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

The project effects have been continued. In the pilot regions of CAR, RO VII, and RO XI, the inspections/repair of roads and bridges by using the technical manuals/guidelines developed/revised by the projects, including the regular inspection and repair, have been continuously conducted but the frequency of regular inspections and repairs have decreased due to the improvement of road and bridge conditions. The trainings of road and bridge maintenance by using the technical manuals/guidelines developed/revised by the project have been conducted by DPWH but the number of trainings has decreased because some of the engineers have been already trained. For the period from February 2016 to January 2019, some trainings, such as the technical guidelines and manuals developed by the project, were conducted under the Phase III (2016-2019) in non-pilot regions as part of the sustainability program in cascading information and skills to other regions.

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

The Overall Goal has been achieved by the time of ex-post evaluation. For the period from 2015 to 2018, DPWH conducted the trainings of road maintenance and bridge maintenance for each Regional Office (Indicator 1). From 2016, the trainings were conducted for non-pilot regions as a part of the project activities of the Phase III. Also, for the same period, all the 10 Regional Offices conducted inspections of roads and bridges at least once by using the technical manuals/guidelines developed/revised by the project and necessary repair works (Indicator 2). In addition, the Department Order (DO no. 94 s. 2014) has been issued instructing all DPWH Regional, District Engineering Offices and Project Management Offices to use the technical guidelines/manuals developed during the Phase II for road and bridge maintenance work and the District Engineering Offices have conducted regular inspection on roads and bridges in accordance with the Department Order No.41 Series of 2016. Conditions of roads and bridges have improved over time because of the regular inspection and maintenance conducted by DPWH (Indicator 3). Only in Region XI that the percentage of roads with bad condition have increased from 2011 to 2018 but such increase can be attributed to calamity and conversion of local/provincial roads to national roads.

Some positive impacts by the project have been observed at the time of ex-post evaluation. The participation of women in the trainings conducted by DPWH increased from 25% in 2015 to 35% in 2019. No negative impact on natural and social environment by the project has been observed.

<Evaluation Result>

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

	Achievement of 110jeet 1 upose and overall Goal							
	Aim	Indicators	Results					
	(Project Purpose)	Indicator 1	Status of the Achievement: achieved (continued)					
	Capability of engineers of	The technical methods and quality control	(Project Completion)					
DPWH, Regional Offices required by the technical		required by the technical	<phase i=""></phase>					
	and district engineering	manuals/guidelines developed/revised by	- The inspection apparatus/equipment introduced by the training, such as the					
	offices on quality	the project are properly utilized and	portable digital clinometer and laser type distance meter, were utilized for					
	management of	practiced in the pilot projects and in other	the routine inspection for roads					
	road/bridge construction	activities.	- Data on bridge quality were collected and analyzed in accordance with the					

Achievement of Project Purpose and Overall Goal

and maintenances and		manual								
maintenance managemen				oridges	were pro	operly diagn	osed in	accorda	ance wit	h the
of road/bridge is improve	£	manua								
in the pilot regions.		<phase ii=""></phase>								
					-	lines develo	ped/revi	sed by	the proj	ect were
		utilized	for pil	ot proj	ects.					
		(Ex-post Ev	aluatior	n)						
		[No. of ins			r of road	ls by using	the tec	hnical	manuals	s/guidelines
		developed/r		-		, ,				C
		1		· · · ·	pe of	2015	2016	201	7 20	18
					tivity	2010	2010	201	0	10
		Pilot Reg	ions		ection	1	0	1		1
		(CAR, RO		-	epair	1	0	1		3
		and RO		I.C.	pan	1	0	1	-	,
			Λ1)							
		No of inco	antinen		of huid	a hu usin	a tha tao	امتنام		/anidalina
		[No. of insp		•	-	ges by using	g the tec	ennical	manuals	s/guidelines
		developed/r	evised t	· · · ·						
					pe of	2015	2016	2017	7 20	18
					tivity					
		Pilot Reg		Insp	ection	1	1	1		7
		(CAR, RO		Re	epair	1	1	1	2	2
		and RO	XI)							
		[No. of regu	lar insp	bection/	/repair of	f bridges in	accordar	nce wit	h the tec	hnical
		manuals/gui	delines	develo	oped/revi	sed by the p	project]			
		Region	Туре	e of	2015	2016	201	7	2018	2019
		U	activ							(plan)
		CAR	Inspec		56	44	27		19	13
			Rep		22	48	67		45	18
		RO VII	Inspec		167	88	70		58	58
		RO VII	Rep		54	36	94		96	74
		DO VI								
		RO XI	Inspec		73	47	14		12	12
			Rep		50	37	60		37	28
	Indicator 2 The number of defects repaired.	Status of the			t: achieve	ed (continue	d)			
	1	(Project Con	npietio	11)						
	1	<phase i=""></phase>	-							
		<phase i=""> - 6 cases</phase>	of the	road re	•					
		<phase i=""> - 6 cases - 12 case</phase>	of the	road re	pair. e repair.					
		<phase i=""> - 6 cases - 12 cases <phase ii=""></phase></phase>	of the the sof the	road re e bridge	e repair.					
		<phase i=""> - 6 cases - 12 cases <phase ii=""></phase></phase>	of the the sof the	road re e bridge	e repair.	tenance wer	e conduc	cted. (1	in CAR	and 1 in
		<phase i=""> - 6 cases - 12 cases <phase ii=""></phase></phase>	of the rest of the projects	road re e bridge	e repair.	tenance wer	e conduc	cted. (1	in CAR	and 1 in
		<phase i=""> - 6 cases - 12 case <phase ii=""> - 2 pilot RO VII</phase></phase>	of the r s of the projects	road re e bridge s for ro	e repair. ad maint	tenance wer				
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	Indicator 3 The engineers of DPWH, Regional Offices	<phase i=""> 6 cases 12 case Phase II> 2 pilot RO VII 8 pilot in RO (Ex-post Ev Refer to the Status of the (Project Context) </phase>	of the s s of the projects) projects XI) aluatior <u>Indicat</u>	road re e bridge s for ro s for br n) cor 1 vement	e repair. pad maint	intenance w	ere cond			
	Indicator 3 The engineers of DPWH, Regional Offices and the district engineering offices are able	<phase i=""> - 6 cases - 12 case - 12 case <phase ii=""> - 2 pilot RO VI - 8 pilot in RO (Ex-post Ev Refer to the Status of the (Project Con <phase i=""></phase></phase></phase>	of the s s of the projects) projects XI) aluation <u>Indicat</u> Achiev npletion	road re e bridge s for ro s for br n) <u>cor 1</u> vement n)	e repair. vad maint ridge mai	intenance we	ere cond ed)	lucted ((4 in RO	VII and 4
	Indicator 3 The engineers of DPWH, Regional Offices and the district engineering offices are able to define the issues in the maintenance	<phase i=""> - 6 cases - 12 case <phase ii=""> - 2 pilot RO VI - 8 pilot in RO I (Ex-post Ev Refer to the Status of the (Project Con <phase i=""> - Damag</phase></phase></phase>	of the s s of the projects) projects XI) aluation <u>Indicat</u> Achiev npletion es on b	road re e bridge s for ro s for br n) vement n) ridges	e repair. vad maint ridge mai t: achieve were pro	ed (continue	ere cond ed)	lucted ((4 in RO	VII and 4
	Indicator 3 The engineers of DPWH, Regional Offices and the district engineering offices are able to define the issues in the maintenance management and propose the necessary	<phase i=""> - 6 cases - 12 case <phase ii=""> - 2 pilot RO VII - 8 pilot in RO (Ex-post Ev Refer to the Status of the (Project Con <phase i=""> - Damag measure</phase></phase></phase>	of the s s of the projects) projects XI) aluation <u>Indicat</u> Achiev npletion es on b	road re e bridge s for ro s for br n) vement n) ridges	e repair. vad maint ridge mai t: achieve were pro	intenance we	ere cond ed)	lucted ((4 in RO	VII and 4
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improved.	Indicator 2	Status of Achievement: achived. (Ex-post Evaluation) [No. of inspection and repair of roads by Regional Offices]							
	The number of inspections and repair works								
	on roads and bridges conducted by the	Type of 2015		201		017	2018		
	Regional Offices by using the technical	activity	2015	201	° 2	017	2010		
	manuals/guidelines developed/revised by	Inspection	7	3		10	10		
	the project.	Repair	7 2			0	9		
		[No. of inspection and repair of bridges by Regional Offices]							
		Type of 2015		201		017	2018		
		activity							
		Inspection	0	1		8	16		
		Repair	7	4		13	15		
	Indicator 3 The percentage of roads and bridges with	Status of Achievement: achieved (Ex-post Evaluation) [% of roads with bad conditions]							
	bad conditions decreases.	1% of roads wi		1	2016	2017	2010		
		D1 11	2011	2015	2016	2017	2018		
		Philippines	13.11	7.57	6.36	5.64	4.67		
		CAR	17.60	17.44	17.60	17.64	14.60		
		RO VII	0.99	1.10	0.99	0.66	0.22		
		RO XI 8.80 8.87 8.80 9.36 9.70 [% of bridges with bad conditions]							
		% of bridges			2016	2015	2010		
		DI 11.	2011	2015	2016	2017	2018		
		Philippines	10.34	6.60	5.24	1.87	1.18		
		CAR	0.45	0.33	0.30	0.12	0.06		
		RO VII	0.60	0.40	0.24	0.13	0.16		
		RO VII RO XI	0.77	0.12	0.10	0.06	0.04		

3 Efficiency

Although the total project period was as planned (ratio against the plan: 100%), the total project cost exceeded the plan (ratio against the plan: 133%). The outputs were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability <Policy Aspect>

The "Philippine Development Plan" (2017-2022) includes the improvement of International Roughness Index (IRI) from 2015 baseline value of 4.62 to 3.0 by the end of 2022. This can be achieved by improving the condition of roads through regular maintenance of roads and bridges. In addition, various Department Orders (DO) have been released in relation to road and bridge maintenance and inspection such as DO 94 series of 2014, DO 41 and 164 series of 2016, DO 23 and 24 series of 2019, among others. Therefore, the trainings and the inspection and repair works based on the technical manuals/guidelines developed/revised by the project have been endorsed by those policies.

<Institutional Aspect>

There has been no change in the organizational setting since the project completion. DPWH has been responsible for budgeting and budget allocation for the trainings of road and bridge maintenance as well as the inspection and repair works of roads and bridges by the Regional Office and District Engineering Offices. The number of maintenance staff of each region has been fixed based on the DPWH budget: CAR with regular employees of 13 and job order (non-permanent) of 21, RO VII with 13 and 56 and RO XI with 13 and 50. There are additional staff working for inspection and repair in the District Engineering Offices that help out the Regional Offices. The total number of trainers for the trainings and OJTs on the improved road and bridge maintenance by using the technical manuals/guidelines developed/revised by the project in the three pilot ROs decreased from 256 in 2015 to 36 in 2019. However, in addition to the Working Group members of the project, the personnel of other ROs have been engaged in the technical trainings and every year the number of trainers increases depending on the training they held because according to DPWH all trained staff can be trainers/resource persons in the future.

<Technical Aspect>

The training mechanism based on the technical manuals/guidelines developed/revised by the project has been sustained due to the DO No.94 Series of 2014 mandating DPWH personnel to conduct inspection and repair works based on those manuals and guidelines. In addition, the regular trainings following those manuals and guidelines have been conducted by the DPWH Bureau of Maintenance for the period from 2017 to 2019. The skills and knowledge of the engineers of the pilot Regional Offices and the District Engineering Offices have sustained at a sufficient level for necessary maintenance of roads and bridges because the conditions of roads and bridges have been improved over the years. Also, the level of skills and knowledge of the engineers of DPWH and the three pilot Regional Offices have been sufficient as resource persons for the technical trainings by DPWH.

As mentioned above, DO No. 94 series of 2014 prescribes the DPWH personnel in charge of implementation such as the Regional Offices, District Engineering Offices and Project Management Offices to adopt the technical manuals and guidelines developed by the project.

<Financial Aspect>

DPWH has continuously allocated the necessary budget for the road and bridge maintenance as well as the technical trainings based on the technical manual/guidelines developed/revised by the project.

<Evaluation Result>

In light of the above, there has been no problem in any aspects. Therefore, the sustainability of the effectiveness through the project is high

5 Summary of the Evaluation

The project achieved the Project Purpose and the Overall Goal through the implementation of the improved road and bridge maintenance by the technical trainings based on the technical manuals/guidelines developed/revised by the project. As for efficiency, the project cost 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:

The DPWH has been able to institutionalize the outputs made by the Project through the issuance of various Department Orders. They have continuously utilized the manuals and handbooks developed by the Project not just for purpose of training but also to actually enhance its operations in terms of inspections and repair works of road and bridges. This is actually a good way to ensure the sustainability and effectiveness of Projects. For future and existing technical projects of JICA, it should be discussed with counterpart agencies on how the outputs would be institutionalized so that the outputs will not just get shelved and forgotten after its completion.



Technical Working Group Meeting



Counterpart Working Group Meeting



Bridge Inspection



Road Inspection