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資料-1: PDM (Version 5 最新版、変遷経緯)

#### 1. Records of Project Design Matrix (PDM)

#### PDM Version 0

Project Name: The Project for Improvement of Water Supply Management of YCDCExecuting AgencyYangon City Development Committee (hereinafter referred as "YCDC")Project Sites: Greater YangonTarget Group: Staff of YCDCDirect beneficiaries : Staff of YCDCIndirect Beneficiaries: People living in the water supply areas of YCDC

Duration of the project: 5 years PDM Version 0 (May 2014)

Narrative Summary	Objectively Ver	ifiable Indicator	Means of Verification	Important Assumptions
[Overall Goal] Water supply services provided by YCDC are enhanced.	<ol> <li>The performance indicators (PIs) are impro- commencement<sup>1</sup>.</li> <li>NRW is decreased from xx% to xx% in the</li> <li>The ratio of water quality test results which from xx% to xx%.</li> </ol>	wed compared to the data at the Project water supply area of YCDC a satisfy water quality standards is increased	Reports prepared by YCDC	
[Project Purpose] Capacity of YCDC on the management of water supply service is improved.	<ol> <li>Evaluation of PIs is conducted periodically</li> <li>NRW is decreased from xx% to xx% in the</li> <li>The ratio of water quality test results which from xx% to xx%. in the pilot treatment plate</li> </ol>	y e pilot area a satisfy water quality standard is increased ants <sup>2</sup>	Reports prepared by YCDC	Fund for YCDC to enable it to execute construction and rehabilitation of facilities such as water treatment plants, disinfection equipment and pipelines is available.
[Outputs]				
1. Capacity of YCDC on institutional management of water supply utility is improved.	<ul> <li>1-1 Plan for institutional management is appr</li> <li>1-2 Plan for human resources development is</li> <li>1-3 Drafts of regulations, standards and guide approved by Yangon Region Government</li> </ul>	oved by Yangon Region Government. approved by Yangon Region Government. lines for water supply services in Yangon is nt	Reports prepared by YCDC	
2. Capacity of YCDC on NRW management is improved.	<ul> <li>2-1 Manuals and training materials are fully u staff</li> <li>2-2 Information of customers and pipes for th</li> <li>2-3 xx% of YCDC staff participates training e</li> <li>2-4 Plan for NRW reduction is approved by Y</li> </ul>	tilized by more than xx persons of YCDC e pilot areas is compiled and updated on NRW /CDC	Reports prepared by YCDC	
3. Capacity of YCDC on water quality management is improved.	<ul> <li>3-1 Manuals and training materials are fully u staff</li> <li>3-2 Result of the water quality test at the pilot periodically</li> <li>3-3 xx% of YCDC staff participates training of 3-4 Plan for improvement of water quality is</li> </ul>	tilized by more than xx persons of YCDC t treatment plants is recorded and monitored on water quality approved by YCDC	Reports prepared by YCDC	
[Activities]		[Inputs]		

1. Capacity of YCDC on institutional management of water supply utility is improved.	Japanese side	<u>Myanmar side</u>	[Pre-condition]
<ul> <li>(1-1) Establish the Planning Section</li> <li>(1-1-1) Establish the Planning Section in Department of Water and Sanitation</li> <li>(1-1-2) Define the division of duties of the Planning Section</li> <li>(1-2-1) Review the current method of calculation and monitoring of performance data</li> <li>(1-2-2) Conduct training of trainers on the calculation and monitoring of Performance Indicators.</li> <li>(1-2-3) Identify the important and available Performance Indicators to be monitored (e.g. water supply ratio, water supply hours, NRW, etc.)</li> <li>(1-2-4) Develop calculation method, manuals and monitoring system of Performance Indicators</li> <li>(1-2-5) Calculate the Performance Indicators</li> <li>(1-2-6) Update and monitor the Performance Indicators periodically</li> <li>(1-3) Formulate regulations, standards and guidelines</li> <li>(1-3-1) Review the existing rules, regulations, standards and guidelines</li> <li>(1-3-2) Identify regulation, standards and guidelines, which can be prepared by YCDC (e.g. design, construction and material standards for distribution pipes, service pipes and meters, tariff collection manuals, guidelines of tariff setting)</li> <li>(1-4) Enhance understanding on financial management for the sustainable operation of water supply service in consideration of future development plans (e.g. general financial management, accounting, asset management, budget</li> </ul>	<ol> <li>Experts         <ol> <li>Consultant team             <ul> <li>Chief Advisor / Water Supply Operation</li> <li>Institutional Capacity Development / Human Resources Management</li> <li>Planning / Monitoring</li> <li>Financial / Business Management</li> <li>NRW (Physical Loss)</li> <li>NRW (Commercial Loss)</li> <li>GIS</li> <li>Operation and Maintenance of Water Supply Facilities</li> <li>Water Quality Management</li> <li>Project Coordination</li> <li>Experts from waterworks Institutional Management (Planning, Finance/Business Management, Regulation/Standard/Guideline, PR, Human Resource), NRW Management (NRW Engineering, Customer Service, Tariff Collection), Water Quality Management (Water Treatment</li> <li>Experts from Vater Treatment</li> <li>Experts Mater Water Treatment</li> </ul> </li> </ol></li></ol>	<ol> <li>Counterpart personnel</li> <li>Office space and facilities</li> <li>Necessary data/ information</li> <li>Local cost for implementation of the activities</li> </ol>	1. Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management
<ul> <li>regulation, tariff setting, PPP, etc.) (1-4-3) Conduct OJT on development of asset ledger</li> <li>(1-5) Strengthen Public Relations (1-5-1) Analyze the effective public relations on water service of YCDC (1-5-2) Conduct awareness raising of YCDC staff (1-5-3) Conduct OJT on the public relations activities</li> <li>(1-6) Strengthen human resources development (1-6-1) Review the existing human resources development system (1-6-2) Identify necessary improvement on structure and materials of the trainings (1-6-3) Conduct trainings of trainers for planning and organizing the trainings (1-6-4) Develop 5-year and 10-year human resources development plans (1-6-5) Launch priority activities as a part of implementing the 5-year human resources development plans (1-5-1) Develop and support implementation of the institutional management plans (1-5-2) Launch priority activities as a part of implementing the 5-year institutional management plans (1-5-2) Launch priority activities as a part of implementing the 5-year institutional management plans</li> <li>(1-5-2) Launch priority activities as a part of implementing the 5-year institutional management plans</li> <li>(2-1) Establish NRW Management Unit (2-1) Establish NRW Management Unit (2-1-2) Define the division of duties of NRW Management Unit</li> </ul>	<ol> <li>Engineering, water Quality Engineering)</li> <li>Equipment Water leakage detector, Equipment and material for NRW reduction in the pilot areas, Water quality analysis equipment, Software, etc.</li> <li>Overseas Training Program Training in Japan and/or neighboring countries</li> <li>Local cost</li> </ol>		

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(2-2) Collect and compile information of NRW		
(2-2-1) Collect information of NRW and implement a baseline survey		
(2-2-2) Compile information of pipes for establishment of GIS		
(2-2-3) Compile customer information into database		
(2.2.2.4) Computer Standard Operation Proceeding (SOP) of the show information management		
(2-2-4) Formulate Standard Operation Procedure (SOF) of the above mornation management		
(2-3) Develop a model on the management of physical loss (leakage, over flow) and human resources development		
(2-3-1) Review current situation and develop phased countermeasures		
(2-3-2) Conduct trainings of trainers		
(2-3-3) Prepare training plan and training materials by the trainers		
(2-3-4) Formulate manuals on physical loss		
(2.5.4.) Formation matures on physical loss		
(2-5-5) Conduct On-51 by the dramers $(2-5-5)$ Conduct On-51 by the dramers $(2-5-5)$		
(2-3-6) Select a pilot area for NKW management activities		
(2-3-7) Prepare action plan and procure equipment for the countermeasures to be taken for reducing physical loss in		
the pilot areas		
(2-3-8) Set up DMAs at the pilot areas		
(2-3-9) Conduct the countermeasures against physical loss in the pilot area		
(2-3-10) Evaluate cost-benefit of contractmeasures against physical loss in the pilot area and formulate the optimal		
model of activities		
(2.2.11) Lengthere are OIT by the two more in the nilet area		
(2-5-11) Implement OF by the dames in the phot area		
(2-3-12) verify the manuals on physical loss		
(2-4) Develop a model on the management of commercial loss (meter fault, miss reading of meter, illegal connection)		
and human resources development		
(2-4-1) Review current situation and develop phased countermeasures		
(2-4-2) Conduct trainings of trainers		
(2-4-3) Prepare training plan and training materials by the trainers		
(2-4-4) Formulate manuals on commercial loss		
(2+4) formation matrix the trainerstate loss		
(2-4+5) conduct On-51 by the trainers		
(2-4-6) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in		
the selected pilot area		
(2-4-7) Conduct the countermeasures against commercial loss in the pilot area		
(2-4-8) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal		
model of activities		
(2-4-9) Implement OJT by the trainers in the pilot area		
(2-4-10) Verify the manuals on commercial loss		
(2-5) Develop and support implementation of the NRW management plans		
(2.5.1) Develop and support miplementation of the New management plans		
(2-5-1) Develop 5-year and 10-year NKW management plans		
(2-5-2) Launch priority activities as a part of implementing the 5-year NKW management plan		
3. Capacity of YCDC on water quality management is improved.		
(3-1) Review current situation and formulate phased countermeasures		
(3-2) Conduct training of trainers on water quality management		
(3-2-1) Conduct training of trainers on the water quality management		
(3.2.2) Prepare the training of numbers of the water quarky management		
(2 - 2 - 2) conduct Off They the training		
(5-2-5) Conduct OII-51 by the framers		
(3-3) Develop SOP for water quality management		
(3-3-1) Develop SOP on water quality test and monitoring		

(3-3-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility		
<ul> <li>(3-4) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility</li> <li>(3-4-1) Conduct OJT on water quality test and monitoring</li> <li>(3-4-2) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility</li> <li>(3-4-3) Verify SOP for water quality management</li> </ul>		
<ul> <li>(3-5) Develop and support implementation of the water quality management plans</li> <li>(3-5-1) Develop 5-year and 10-year water quality management plans</li> <li>(3-5-2) Launch priority activities as a part of implementing 5-year water quality management plan</li> </ul>		

1 PIs and their baseline data will be set approximately 6 months after the Project commencement. Considering the monitoring results of PIs, target values of respective PIs will be discussed within the Project and decided by JCC. 2 The pilot water treatment plants will be existing Nyaunghnapin Water Treatment Plant and Lagunbyin Water Treatment Plant under construction

Project Name: The Project for Improvement of Water Supply Management of YCDC (PDM Ver.1)Executing Agency: Yangon City Development Committee (hereinafter referred as "YCDC")Project Sites: Greater YangonTarget Group: Staff of YCDCDirect beneficiaries: Staff of YCDCIndirect Beneficiaries: People living in the water supply areas of YCDC

Duration of the Project: 5 years (5<sup>th</sup> July to 4<sup>rd</sup> July 2020) PDM Version 1 (February 2016)

Narrative Summary	Objectively Ve	rifiable Indicator	Means of Verification	Important Assumptions
[Overall Goal] Water supply services provided by YCDC are enhanced.	<ol> <li>The performance indicators (PIs) are in Project commencement<sup>1</sup>.</li> <li>NRW is decreased from xx% to xx% i</li> <li>The ratio of water quality test results wincreased from xx% to xx%.</li> </ol>	mproved compared to the data at the in the water supply area of YCDC which satisfy water quality standards is	Reports prepared by YCDC	
[Project Purpose] Capacity of YCDC on the management of water supply service is improved.	<ol> <li>Evaluation of PIs is conducted period</li> <li>NRW is decreased from xx% to xx%</li> <li>The ratio of water quality test results wincreased from xx% to xx%. in the pile</li> </ol>	ically in the pilot area which satisfy water quality standard is ot treatment plants <sup>1</sup>	Reports prepared by YCDC	Fund for YCDC to enable it to execute construction and rehabilitation of facilities such as water treatment plants, disinfection equipment and pipelines is available.
[Outputs]				
<ol> <li>Capacity of YCDC on institutional management of water supply utility is improved.</li> </ol>	<ul> <li>1-1 Plan for institutional management is</li> <li>1-2 Plan for human resources developme Government.</li> <li>1-3 Drafts of regulations, standards and g Yangon is approved by Yangon Reg</li> <li>1-4 New organization structure is approved</li> </ul>	approved by Yangon Region Government. ent is approved by Yangon Region guidelines for water supply services in gion Government red by Mavor.	Reports prepared by YCDC	
2. Capacity of YCDC on NRW management is improved.	<ul> <li>2-1 Manuals and training materials are fu YCDC staff</li> <li>2-2 Information of customers and pipes f</li> <li>2-3 xx% of YCDC staff participates train</li> <li>2-4 Plan for NRW reduction is approved</li> </ul>	ally utilized by more than xx persons of for the pilot areas is compiled and updated hing on NRW by YCDC	Reports prepared by YCDC	
3. Capacity of YCDC on water quality management is improved.	<ul> <li>3-1 Manuals and training materials are full YCDC staff</li> <li>3-2 Result of the water quality test at the monitored periodically</li> <li>3-3 xx% of YCDC staff participates train</li> <li>3-4 Plan for improvement of water quality</li> </ul>	ally utilized by more than xx persons of pilot treatment plants is recorded and ning on water quality ty is approved by YCDC	Reports prepared by YCDC	
[Activities]	1	[	[nputs]	

1. Capacity of YCDC on institutional management of water supply utility is improved.	Japanese side	<u>Myanmar side</u>	[Pre-condition]
<ul> <li>(1-1) Prepare overall new organization structure</li> <li>(1-2) Establish the Planning Section in Department of Water and Sanitation</li> <li>(1-2-1) Establish the Planning Section in Department of Water and Sanitation</li> <li>(1-2-2) Define the division of duties of the Planning Section</li> <li>(1-3) Establish Customer Service Division</li> <li>(1-3-1) Establish the Customer Service Division in Department of Water and Sanitation</li> <li>(1-3-1) Establish the Customer Service Division in Department of Water and Sanitation</li> <li>(1-3-2) Define the division of duties of the Customer Service Division</li> <li>(1-4) Develop and Monitor Performance Indicators (PIs)</li> <li>(1-4-1) Review the current method of calculation and monitoring of performance data</li> <li>(1-4-2) Conduct training of trainers on the calculation and monitoring of Performance Indicators.</li> <li>(1-4-3) Identify the important and available Performance Indicators to be monitored (e.g. water supply ratio, water supply hours, NRW, etc.)</li> <li>(1-4-4) Install transmission flow meter and data logger and collect flow data</li> <li>(1-4-5) Procure equipment (computers, printers, software, etc.) in local offices and conduct training</li> <li>(1-4-6) Collect data required for setting PIs</li> <li>(1-4-7) Develop calculation method, manuals and monitoring system of Performance Indicators</li> <li>(1-4-8) Calculate the Performance Indicators</li> <li>(1-4-9) Update and monitor the Performance Indicators periodically</li> <li>(1-5-1) Review the existing rules, regulations, standards and guidelines</li> <li>(1-5-1) Review the existing rules, regulations, standards and guidelines</li> <li>(1-5-3) Draft necessary regulation, standards and guidelines, which can be prepared by YCDC (e.g. design, construction and material standards for distribution pipes, service pipes and meters, tariff collection manuals, guidelines of fariff setting)</li> </ul>	<ol> <li>Experts         <ol> <li>Consultant team             <ul> <li>Chief Advisor / Water Supply Operation</li> <li>Institutional Capacity Development / Human Resources Management</li> <li>Planning / Monitoring</li> <li>Financial / Business Management- NRW (Physical Loss)</li> <li>NRW (Commercial Loss)</li> <li>GIS</li> <li>Operation and Maintenance of Water Supply Facilities</li> <li>Water Quality Management</li> <li>Project Coordination</li> <li>Experts from waterworks Institutional Management (Planning, Finance/Business Management, Regulation/Standard/Guideline, PR, Human Resource), NRW Management (NRW Engineering, Customer Service, Tariff Collection), Water Quality Management (Water Treatment Engineering, Water Quality Engineering)</li> </ul> </li> </ol></li></ol>	<ol> <li>Counterpart personnel</li> <li>Office space and facilities</li> <li>Necessary data/ information</li> <li>Local cost for implementation of the activities</li> <li>Distribution flow monitoring         <ul> <li>To design and construct chambers for flow meters</li> <li>To take security measures (constructing gates and fences for flow meters and other accessories)</li> <li>To supply electricity to the site</li> <li>Water quality monitoring</li> <li>To sucure space for provisional equipment in laboratory in Head Office.</li> <li>To allocate space for equipment.</li> <li>To procure reagents for the equipment procured by Japanese side (Japanese side will provide necessary amount for 6<sup>th</sup> month after procurement and</li> </ul> </li> </ol>	1. Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management
<ul> <li>(1-6) Enhance understanding on financial management</li> <li>(1-6-1) Analyze the current financial management system</li> <li>(1-6-2) Implement training on financial management for the sustainable operation of water supply service in consideration of future development plans (e.g. general financial management, accounting, asset management, budget regulation, tariff setting, PPP, etc.)</li> <li>(1-6-3) Conduct OJT on development of asset ledger</li> <li>(1-7) Strengthen Public Relations</li> <li>(1-7-1) Analyze the effective public relations on water service of YCDC</li> <li>(1-7-2) Conduct awareness raising of YCDC staff</li> <li>(1-7-3) Conduct OJT on the public relations activities</li> <li>(1-8) Strengthen human resources development</li> <li>(1-8-1) Review the existing human resources development system</li> <li>(1-8-2) Identify necessary improvement on structure and materials of the trainings</li> <li>(1-8-3) Conduct trainings of trainers for planning and organizing the trainings</li> <li>(1-8-4) Develop 5-year and 10-year human resources development plans</li> <li>(1-8-5) Launch priority activities as a part of implementing the 5-year human resources development plan</li> </ul>	<ol> <li>Equipment Water leakage detector, Equipment and material for NRW reduction in the pilot areas, Water quality analysis equipment, Equipment for water quality management, Flow meter and data logger for flow monitoring system, Computers and printers, Software, etc.</li> <li>Overseas Training Program Training in Japan and/or neighboring countries</li> <li>Local cost</li> </ol>	<ul> <li>installation)</li> <li>Non-revenue water</li> <li>To procure materials which YCDC can procure locally and routinely</li> <li>To secure storage space for the equipment and materials procured</li> <li>To conduct civil works for construction of DMA (digging, piping, back-filling, and restoration)</li> <li>Collection of computerized data for Performance indicators</li> <li>To deliver and installation of all provided equipment (such as PCs) to secure space for installing PCs</li> </ul>	

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(1.9.1) Develop 5 year and 10 year institutional management plans	
(1-2-1) Develop 5-year and 10-year institutional management plans	ro procure consumables
(1-9-2) Launch priority activities as a part of implementing the 5-year institutional management plan	(including printer inks)
	> To bear necessary operational
2. Capacity of YCDC on NRW management is improved.	
	costs for the training
(2-1) Establish NRW Management Unit	➤ To update anti-virus software
(2-1-1) Establish NRW Management Unit	periodically
(2-1-2) Define the division of duties of NRW Management Unit	
(2-1-2) before the division of dutes of fifth vialagement offic	Civil work (construction of flow
	meter chamber), Safety fence for
(2-2) Collect and compile information of NRW	flow meters and panels, and
(2-2-1) Collect information of NRW and implement a baseline survey	
(2-2-2) Compile information of pipes for establishment of GIS	electricity supply for flow meter
(2-2-3) Compile customer information into database	installation
(2-2-4) Formulate Standard Operation Procedure (SOP) of the above information management	
()	
(2.3) Develop a model on the management of physical loss (leakage, over flow) and human resources	
(25) Develop a model on the management of physical loss (leakage, over now) and numan resources	
development	
(2-3-1) Review current situation and develop phased countermeasures	
(2-3-2) Conduct trainings of trainers	
(2-3-3) Prepare training plan and training materials by the trainers	
(2-3-4) Formulate manuals on physical loss	
(2-3-5) Conduct Off-JT by the trainers	
(2-3-6) Select a pilot area for NRW management activities	
(2-3-7) Prepare action plan and procure equipment for the countermeasures to be taken for reducing	
nhysical loss in the nilot areas	
(2.2.8) Set up DMAs at the relations	
(2-3-8) Set up DMAs at the phot areas	
(2-3-9) Conduct the countermeasures against physical loss in the pilot area	
(2-3-10) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate	
the optimal model of activities	
(2-3-11) Implement OJT by the trainers in the pilot area	
(2-3-12) Verify the manuals on physical loss	
(C +)	
(2-4) Develop a model on the management of commercial loss (meter fault miss reading of meter illegal	
(2-4) Develop a model on the management of comments and single faith, miss reading of meter, mega	
connection) and numan resources development	
(2-4-1) Review current situation and develop phased countermeasures	
(2-4-2) Conduct trainings of trainers	
(2-4-3) Prepare training plan and training materials by the trainers	
(2-4-4) Formulate manuals on commercial loss	
(2-4-5) Conduct Off-JT by the trainers	
(2-4-6) Prepare action plan and procurement of equipment for the countermeasures to be taken for	
commercial loss in the selected pilot area	
(2-4-7) Conduct the countermeasures against commercial loss in the pilot area	
(2.4.8) Evaluate cost-henefit of countermeasures against obvious have prior and a point of the solution of countermeasures against obvious have been the solution of the solut	
$(2 - \sigma)$ Evaluate cost-orient of connermeasures against physical loss in the phot area and formulate the exting	
(2.4.0) Leave to TT had a series of the TT is the series of the TT is the series of the the series of the series o	
(2-4-9) implement OJ1 by the trainers in the pilot area	
(2-4-10) Verify the manuals on commercial loss	
(2-5) Develop and support implementation of the NRW management plans	
(2-5-1) Develop 5-year and 10-year NRW management plans	
(2-5-2) Launch priority activities as a part of implementing the 5-year NRW management plan	
2 Consoity of VCDC on water quality management is improved	
p. Capacity of a CDC off water quality management is improved.	

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<ul> <li>(3-1) Establish Water Treatment Section</li> <li>(3-1-1) Establish Water Treatment Section in Department of Water and Sanitation</li> <li>(3-1-2) Define the division of duties of the Water Treatment Section</li> <li>(3-1-3) Hold a series of seminar for basic water treatment technology with study tours</li> </ul>		
(3-2) Review current situation and formulate phased countermeasures		
<ul> <li>(3-3) Conduct training of trainers on water quality management</li> <li>(3-3-1) Conduct training of trainers on the water quality management</li> <li>(3-3-2) Prepare the training plan and training materials by the trainers</li> <li>(3-3-3) Conduct Off-JT by the trainers</li> </ul>		
<ul> <li>(3-4) Develop SOP for water quality management</li> <li>(3-4-1) Develop SOP on water quality test and monitoring</li> <li>(3-4-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility</li> </ul>		
<ul> <li>(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility</li> <li>(3-5-1) Procure water quality analysis and water quality management equipment</li> <li>(3-5-2) Conduct OJT on water quality test and monitoring</li> <li>(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant</li> <li>(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin</li> <li>(3-5-5) Prepare an improvement plan of Nyaunghnapin water treatment plant</li> <li>(3-5-6) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility</li> <li>(3-5-7) Verify SOP for water quality management</li> </ul>		
<ul> <li>(3-6) Conduct OJT on improvement of water quality supplied from reservoirs</li> <li>(3-6-1) Review water quality problems in reservoir water</li> <li>(3-6-2) Research water quality improvement measure of reservoir suppled water</li> </ul>		
<ul> <li>(3-7) Develop and support implementation of the water quality management plans</li> <li>(3-7-1) Develop 5-year and 10-year water quality management plans</li> <li>(3-7-2) Launch priority activities as a part of implementing 5-year water quality management plan</li> </ul>		

1: The pilot water treatment plants will be existing Nyaunghnapin Water Treatment Plant and Lagunbyin Water Treatment Plant under construction.

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Indirect Beneficiaries : People living in the water supply areas of YCDC

Duration of the Project: 5 years (5<sup>th</sup> July to 4<sup>rd</sup> July 2020) PDM Version 2 (May 2017)

Narrative Summary	Objec	ctively Verifiable Indicator		Means of Verification	Important Assumptions
<b>[Overall Goal]</b> Water supply services provided by YCDC are enhanced.	<ol> <li>The performance indicators (PIs) are i</li> <li>NRW is decreased from xx% to xx% i</li> <li>The ratio of water quality test results v xx%.</li> </ol>	improved compared to the data at the Project com in the water supply area of YCDC which satisfy water quality standards is increased	mencement <sup>1</sup> . from xx% to	Reports prepared by YCDC	
[Project Purpose] Capacity of YCDC on the management of water supply service is improved.	<ol> <li>Evaluation of PIs is conducted period</li> <li>NRW is decreased from xx% to xx%</li> <li>The ratio of water quality test results v xx%. in the pilot treatment plants<sup>1</sup></li> </ol>	lically in the pilot area which satisfy water quality standard is increased f	rom xx% to	Reports prepared by YCDC	Fund for YCDC to enable it to execute construction and rehabilitation of facilities such as water treatment plants, disinfection equipment and pipelines is available.
[Outputs]					
<ol> <li>Capacity of YCDC on institutional management of water supply utility is improved.</li> </ol>	<ul> <li>1-1 Plan for institutional management is</li> <li>1-2 Plan for human resources development</li> <li>1-3 Drafts of regulations, standards and generation of the standards of the standards and generation of the standards of the standards and generation structure is approved to the standards of the standards of</li></ul>	approved by Yangon Region Government. ent is approved by Yangon Region Government. guidelines for water supply services in Yangon is yed by Mayor.	approved by	Reports prepared by YCDC	
2. Capacity of YCDC on NRW management is improved.	<ul> <li>2-1 Manuals and training materials are fully utilized by more than xx persons of YCDC staff</li> <li>2-2 Information of customers and pipes for the pilot areas is compiled and updated</li> <li>2-3 xx% of YCDC staff participates training on NRW</li> <li>2-4 Plan for NRW reduction is approved by YCDC</li> </ul>			Reports prepared by YCDC	
3. Capacity of YCDC on water quality management is improved.	<ul> <li>3-1 Manuals and training materials are find the state of the water quality test at the 3-3 xx% of YCDC staff participates train 3-4 Plan for improvement of water quality of the state of the s</li></ul>	ully utilized by more than xx persons of YCDC st pilot treatment plants is recorded and monitored ning on water quality ty is approved by YCDC	aff periodically	Reports prepared by YCDC	
[Activities]		[Input	s]		
1. Capacity of YCDC on institutional management of water supply u	tility is improved.	Japanese side	<u>Myanmar s</u>	<u>ide</u>	[Pre-condition]
(1-1) Prepare overall new organization structure		2. Experts	<ol> <li>Counte</li> <li>Office</li> </ol>	rpart personnel	1. Top management of YCDC
<ul> <li>(1-2) Establish the Planning Section</li> <li>(1-2-1) Establish the Planning Section in Department of Water an</li> <li>(1-2-2) Define the division of duties of the Planning Section</li> </ul>	d Sanitation	- Chief Advisor / Water Supply Operation     - Institutional Capacity Development /     Human Resources Management	<ol> <li>Necess</li> <li>Local c implem</li> </ol>	ary data/ information ost for uentation of the	show the strong leadership and commitment to the capacity development on
<ul> <li>(1-3) Establish Customer Service Division</li> <li>(1-3-1) Establish the Customer Service Division in Department o</li> <li>(1-3-2) Define the division of duties of the Customer Service Div</li> </ul>	f Water and Sanitation ision	<ul> <li>Planning / Monitoring</li> <li>Financial / Business Management- NRW (Physical Loss)</li> <li>NRW (Commercial Loss)</li> </ul>	activitio ● Distribut > To des	es ion flow monitoring ign and construct	institutional management

(1-3-3) Establish operation system of the Customer Service Division	- GIS	chambers for flow meters	
	- Operation and Maintenance of Water	> To take security measures	
(1-4) Develop and Monitor Performance Indicators (PIs)	Supply Facilities	(constructing gates and	
(1-4-1) Review the current method of calculation and monitoring of performance data	- Water Quality Management	fances for flow maters and	
(1-4-2) Conduct training of trainers on the calculation and monitoring of Performance Indicators.	- Project Coordination	other appaganies)	
(1-4-3) Identify the important and available Performance Indicators to be monitored (e.g. water supply		The last is a d	
ratio, water supply hours, NRW, etc.)	2) Experts from waterworks	> To supply electricity to the	
(1-4-4) Install transmission flow meter and data logger and collect flow data	Institutional Management (Planning,	site	
(1-4-5) Procure equipment (computers, printers, software, etc.) in local offices and conduct training	Finance/Business Management,	<ul> <li>Water quality monitoring</li> </ul>	
(1-4-6) Conect data required for setting PIS (1-4-7) Device relations and the setting and manifering system of Derformance Indicators	Human Basauraa) NBW Managament	To secure space for	
(1-++) Develop calculation include, manuals and monitoring system of reformance indicators (1-4-8) Calculate the Performance Indicators	(NRW Engineering Customer Service	provisional equipment in	
(1-4-9) Undate and ponitor the Performance Indicators periodically	Tariff Collection) Water Quality	laboratory in Head Office.	
(1 )) optime and monitor the renormance includios periodically	Management (Water Treatment	$\succ$ To allocate space for	
(1-5) Formulate regulations, standards and guidelines	Engineering, Water Quality Engineering)	equipment in reservoir site	
(1-5-1) Review the existing rules, regulations, standards and guidelines	gg,	for equipment	
(1-5-2) Identify regulation, standards and guidelines to be modified and/or newly formulated		To progure reagents for the	
(1-5-3) Draft water supply regulation and run a trial	2. Equipment	<ul> <li>To produce reagents for the</li> </ul>	
(1-5-4) Draft necessary regulation, standards and guidelines, which can be prepared by YCDC (e.g.	Water leakage detector, Equipment and	equipment procured by	
design, construction and material standards for distribution pipes, service pipes and meters, tariff	material for NRW reduction in the pilot	Japanese side (Japanese side	
collection manuals, guidelines of tariff setting)	areas, Water quality analysis equipment,	will provide necessary	
	Equipment for water quality management,	amount for 6 <sup>th</sup> month after	
(1-6) Enhance understanding on financial management	Flow meter and data logger for flow	procurement and	
(1-6-1) Analyze the current financial management system	nonitoring system, computers and	installation)	
(1-0-2) implement training on innancial management for the sustainable operation of water supply service	princis, software, etc.	Non-revenue water	
m consideration of future development plans (e.g. general manetal management, accounting, asset		> To procure materials which	
(1-6-3) Conduct OIT on development of asset ledger	3. Overseas Training Program	YCDC can procure locally	
(1-0-5) conduct of 1 on development of asset redget	Training in Japan and/or neighboring	and routinely	
(1-7) Strengthen Public Relations	countries	To secure storage space for	
(1-7-1) Analyze the effective public relations on water service of YCDC		the equipment and materials	
(1-7-2) Conduct awareness raising of YCDC staff	4 Local cost	measured	
(1-7-3) Conduct OJT on the public relations activities	1. Eodur cost	The second secon	
		> To conduct civil works for	
(1-8) Strengthen human resources development		construction of DMA	
(1-8-1) Review the existing human resources development system		(digging, piping,	
(1-8-2) Identify necessary improvement on structure and materials of the trainings		back-filling, and restoration)	
(1-8-3) Conduct trainings of trainers for planning and organizing the trainings		<ul> <li>Collection of computerized</li> </ul>	
(1-8-4) Develop 5-year and 10-year numan resources development plans		data for Performance	
(1-6-5) Launch priority activities as a part of implementing the 5-year numan resources development plan		indicators	
(1-9) Develop and support implementation of the institutional management plans		> To deliver and installation of	
(1-9-1) Develop 5-year and 10-year institutional management plans		all provided equipment	
(1-9-2) Launch priority activities as a part of implementing the 5-year institutional management plan		(such as PCs) to each branch	
		office	
2. Capacity of YCDC on NRW management is improved.		To secure space for	
		installing PCs	
(2-1) Establish NRW Management Unit			
(2-1-1) Establish NRW Management Unit		✓ 10 procure consumables	
(2-1-2) Define the division of duties of NKW Management Unit		(including printer inks)	
(2.2) Collect and compile information of NPW		➢ To bear necessary	
(2-2) Concert and compile information of NKW		operational costs for the	

(2.2.1) Collect information of NPW and implement a baseline survey	1	4	
(2-2-1) Concet momentation of Network and implement a data the survey		training	
(2-2-2) Compile information of pipes for establishment of GIS		To update anti-virus	
(2-2-3) Compile customer information into database		software periodically	
(2-2-4) Formulate Standard Operation Procedure (SOP) of the above information management		• Civil work (construction of	
(2-3) Develop a model on the management of physical loss (leakage, over flow) and human resources		flow meter chamber), Safety	
development		fence for flow meters and	
(2-3-1) Review current situation and develop phased countermeasures		panels, and electricity supply	
(2-3-2) Conduct trainings of trainers		for flow motor installation	
- Conduct trainings of trainers through implementation of Non-revenue water (NRW) pilot		for now meter instantation	
project in North Okkalana			
(2.2.2.) Demonstration along and training metanials by the trainage			
(2-3-3) Trepare training plan and training materials by the trainers			
(2-3-4) Formulae manuals on physical loss			
(2-3-5) Conduct Off-J1 by the trainers			
(2-3-6) Select a pilot area for NRW management activities			
(2-3-7) Prepare action plan and procure equipment for the countermeasures to be taken for reducing			
physical loss in the pilot areas			
(2-3-8) Set up DMAs at the pilot areas			
(2-3-9) Conduct the countermeasures against physical loss in the pilot area			
(2-3-10) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the			
optimal model of activities			
(2-3-11) Implement OJT by the trainers in the pilot area			
(2-3-12) Verify the manuals on physical loss			
(2-4) Develop a model on the management of commercial loss (meter fault miss reading of meter illegal			
(2) be observed on the management of the management and the second secon			
(2.4.1) Provide current situation and develop phased countermeasures			
(2-4-1) Review entern statation and develop phased countermeasures			
(2-4-2) Conduct namings of damers			
- Conduct unamings of trainers unough implementation of Non-revenue water (NKW) phot project			
in North Okkalapa			
(2-4-5) Prepare training plan and training materials by the trainers			
(2-4-4) Formulate manuals on commercial loss			
(2-4-5) Conduct Off-JT by the trainers			
(2-4-6) Prepare action plan and procurement of equipment for the countermeasures to be taken for			
commercial loss in the selected pilot area			
(2-4-7) Conduct the countermeasures against commercial loss in the pilot area			
(2-4-8) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the			
optimal model of activities			
(2-4-9) Implement OJT by the trainers in the pilot area			
(2-4-10) Verify the manuals on commercial loss			
(2-5) Develop training yard for NRW management			
(2-5-1) Prepare training plan for training vard			
(2-5-2) Design training vard			
(2-5-3) Prenare equipment and materials for training yard			
(25-5-4) Construct training yard			
(2.5.5) Prepare training manuals and materials for training yard and conduct trainings of the trainers in			
(2.5.5) repart during manuals and materials for during yard and conduct durings of the durines in			
(2.5.6) Conduct Off IT by the training view			
(2-5-6) Conduct OII-51 by the training yard			
(2.6) Develop and summer involvementation of the NDW more concern tailors			
(2-0) Develop and support implementation of the NKW management plans			
(2-6-1) Develop 5-year and 10-year NRW management plans			

(2-6-2) Launch priority activities as a part of implementing the 5-year NRW management plan		
3. Capacity of YCDC on water quality management is improved.		
<ul> <li>(3-1) Establish Water Treatment Section</li> <li>(3-1-1) Establish Water Treatment Section in Department of Water and Sanitation</li> <li>(3-1-2) Define the division of duties of the Water Treatment Section</li> <li>(3-1-3) Hold a series of seminar for basic water treatment technology with study tours</li> </ul>		
(3-2) Review current situation and formulate phased countermeasures		
<ul> <li>(3-3) Conduct training of trainers on water quality management</li> <li>(3-3-1) Conduct training of trainers on the water quality management</li> <li>(3-3-2) Prepare the training plan and training materials by the trainers</li> <li>(3-3-3) Conduct Off-JT by the trainers</li> </ul>		
<ul> <li>(3-4) Develop SOP for water quality management</li> <li>(3-4-1) Develop SOP on water quality test and monitoring</li> <li>(3-4-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility</li> </ul>		
<ul> <li>(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility</li> <li>(3-5-1) Procure water quality analysis and water quality management equipment</li> <li>(3-5-2) Conduct OJT on water quality test and monitoring</li> <li>(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant</li> <li>(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin</li> <li>(3-5-5) Prenare an improvement plan of Nyaunghnapin water treatment plant</li> </ul>		
(3-5-6) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility (3-5-7) Verify SOP for water quality management		
<ul> <li>(3-6) Conduct OJT on improvement of water quality supplied from reservoirs</li> <li>(3-6-1) Review water quality problems in reservoir water</li> <li>(3-6-2) Research water quality improvement measure of reservoir suppled water</li> </ul>		
<ul> <li>(3-7) Develop and support implementation of the water quality management plans</li> <li>(3-7-1) Develop 5-year and 10-year water quality management plans</li> <li>(3-7-2) Launch priority activities as a part of implementing 5-year water quality management plan</li> </ul>		

<sup>1</sup> PIs and their baseline data will be set approximately 1 to 2 year(s) after the Project commencement. Considering the monitoring results of PIs, target values of respective PIs will be discussed within the Project and decided by JCC.

Project Name: The Project for Improvement of Water Supply Management of YCDC (PDM Ver.3)Executing Agency: Yangon City Development Committee (hereinafter referred to as "YCDC")Project Sites: Greater YangonTarget Group: Staff of YCDCDirect beneficiaries: Staff of YCDCIndirect Beneficiaries: People living in the water supply areas of YCDC

Duration of the Project: 5 years (5<sup>th</sup> July 2015 to 4<sup>rd</sup> July 2020) PDM Version 3 (August 2018)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumptions
[Overall Goal] Water supply services provided by YCDC are enhanced.	<ol> <li>The management key performance indicators (MKPIs) are improved compared to the data at the Project commencement<sup>1</sup>.</li> <li>NRW is decreased from OO % to OO % in the water supply area of YCDC.</li> <li>The compliance ratio in terms of turbidity to meet the water quality standard is increased from OO% to OO%. The compliance ratio is increased from OO% to OO% in terms of residual chlorine (&gt;0.2 mg/l).</li> </ol>	<ol> <li>S/C2 activity record, MKPIs monitoring sheets.</li> <li>S/C1 activity record, MKPIs monitoring sheets.</li> <li>Water quality monitoring report, MKPIs monitoring sheets.</li> </ol>	
[Project Purpose]			YCDC will obtain
Capacity of YCDC on the management of water supply service is improved.	1. Steering Committees (S/C) are organized and improvement actions are implemented.	1. Appointment letter for S/C members, S/C1, 2, 3 activity record.	external funds for construction and rehabilitation of water
	2. Mid-term management plan is approved by EDWS.	2. Approval of Mid-term management plan in S/C2, or approval letter of the Head of Department (CE).	treatment plant, disinfection facility
	3. The implementation of mid-term management plan is monitored based on MKPIs.	3. MKPIs monitoring sheets.	and distribution pipes.
	4. The NRW ratio is grasped in the water supply service area of YCDC and monitored.	4. NRW management report.	etc.
	5. Plan for NRW reduction is approved by EDWS.	5. Approval of Plan for NRW reduction in S/C1, or approval letter of CE.	
	6. Water quality is grasped in the water supply service area of YCDC and monitored.	6. Monthly water quality monitoring report.	
	7. Plan for improvement of water quality is approved by EDWS.	7. Approval of Plan for improvement of water quality in S/C2, or approval letter of CE.	
[Outputs]			
<ol> <li>Capacity of YCDC on institutional management of water supply utility is improved.</li> </ol>	1-1 Plan for improvement of water bill collection is approved by EDWS.	1-1 Approval in S/C2, or approval letter of CE.	
	1-2 Plan for human resources development is approved by EDWS.	1-2 Approval in S/C2, or approval letter of CE.	
	1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by EDWS.	1-3 Approval in S/C3, or approval letter of CE.	
	1-4 New organization structure is approved by Mayor.	1-4 Approval letter, or approval process confirmed by the Experts.	
	1-5 2 Full time staff members in Planning Section can give direction of PDCA cycle to EDWS staff.	1-5 Evaluation by JICA Experts based on duties of Management Planning Unit in Planning Section in	
2. Capacity of YCDC on NRW management is improved	2-1 Manuals and training materials on NRW management are utilized by YCDC staff.	2-1 Manuals in relevant offices and training record.	
	2-2 Information of customers and pipes for the pilot areas is compiled and updated.	2-2 Pilot project activity report.	
	2-3 The number of trainers for NRW management becomes 8.	2-3 S/C1 activity record, Evaluation by JICA Experts	
		based on a check sheet indicating necessary abilities	
		for trainers. The check list to be prepared in the project	
		in advance.	
	2-4 EDWS staff participates in training based on training plan for NRW management.	2-4 Training attendance record, HRD report (HRD Section)	

	2-5 NRW ratio is decreased to 25% in the pilot area.		2-5 S/C1 activity record	, Pilot project activity report.	
3. Capacity of YCDC on water quality	3-1 Manuals and training materials on water quality management are full	y utilized by	3-1 S/C3 monitoring rep	port, manuals in relevant	
management is improved.	YCDC staff.		offices, training record.		
	3-2 Result of the water quality test by the central laboratory and on-site m recorded and monitored periodically.	nini laboratory is	3-2 Monthly water qual	ity monitoring report.	
	3-3 The number of trainers for water quality management becomes 4.		3-3 Evaluation by JICA	Experts based on a check sheet	
			indicating necessary abi	lities for trainers. The check	
			list to be prepared in the	project in advance.	
	3-4 EDWS staff participates in training based on training plan for water of management	uality	3-4 Training attendance	record, HRD report (HRD	
	<ul> <li>3-5 The turbidity of treated water in pilot sand filter in Nyaunghnapin wa plant is controlled less than 1 NTU.</li> </ul>	ter treatment	3-5 Activity report of Ta	iskforce team.	
	3-6 The operation and maintenance system of Lagunbyin water treatment prepared.	plant is	3-6 Operation and main of Lagunbyin water treat	tenance organization structure the tenance organization structure the tenance of ten	
	3-7 The operation and maintenance system of chlorination facilities is pro-	epared.	3-7 Operation and main of chlorination facilities	tenance organization structure	
[Activities]			[Input:	s]	
1. Capacity of YCDC on institutional management	of water supply utility is improved.	Japanese side		<u>Myanmar side</u>	[Pre-condition]
<ul> <li>(1-1) Prepare overall new organization structure</li> <li>(1-2) Establish the Planning Section</li> <li>(1-2-1) Establish the Planning Section in Depart</li> <li>(1-2-2) Define the division of duties of the Planning</li> <li>(1-3) Establish Customer Service Division</li> <li>(1-3-1) Establish the Customer Service Division</li> <li>(1-3-2) Define the division of duties of the Custor</li> <li>(1-3-2) Define the division of duties of the Custor</li> <li>(1-3-3) Establish operation system of the Custor</li> <li>(1-4) Develop and Monitor Performance Indicators</li> <li>(1-4-1) Review the current method of calculation</li> <li>(1-4-2) Conduct training of trainers on the calculation</li> <li>(1-4-3) Identify the important and available Perf hours, NRW, etc.)</li> <li>(1-4-4) Install transmission flow meter and data</li> <li>(1-4-5) Procure equipment (computers, printers,</li> <li>(1-4-6) Collect data required for setting PIs</li> <li>(1-4-7) Develop calculation method, manuals an</li> <li>(1-4-9) Update and monitor the Performance Indicators</li> <li>(1-5-1) Review the existing rules, regulations, st</li> <li>(1-5-2) Identify regulation, standards and guidel</li> <li>(1-5-4) Draft necessary regulation, standards and and run at</li> <li>(1-5-4) Draft necessary regulation pipes, ser</li> </ul>	ment of Water and Sanitation hing Section in Department of Water and Sanitation omer Service Division (PIs) n and monitoring of performance data lation and monitoring of Performance Indicators. formance Indicators to be monitored (e.g. water supply ratio, water supply logger and collect flow data software, etc.) in local offices and conduct training d monitoring system of Performance Indicators licators periodically nes andards and guidelines ines to be modified and/or newly formulated rial d guidelines, which can be prepared by YCDC (e.g. design, construction vice pipes and meters, tariff collection manuals, guidelines of tariff setting)	<ol> <li>Experts         <ol> <li>Experts</li> <li>Consultan                 <ul> <li>Chief Advis</li>                         Operation</ul></li>                         Institutiona</ol></li></ol>	t team sor / Water Supply I Capacity Development tesources Management Monitoring Business Management- rsical Loss) mercial Loss) and Maintenance of ply Facilities ity Management rdination om waterworks Management, andard/Guideline, PR, urce), NRW (NRW Engineering, vice, Tariff Collection), / Management (Water gineering, Water Quality	<ol> <li>Counterpart personnel</li> <li>Office space and facilities</li> <li>Necessary data/ information</li> <li>Local cost for implementation of the activities</li> <li>Distribution flow monitoring</li> <li>To design and construct chambers for flow meters</li> <li>To take security measures (constructing gates and fences for flow meters and other accessories)</li> <li>To supply electricity to the site</li> <li>Water quality monitoring</li> <li>To secure space in laboratory in Head Office for equipment procured.</li> <li>To allocate space for</li> </ol>	1. Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management
(1-6) Enhance understanding on financial management (1-6-1) Analyze the current financial management	nent nt system	and material f	or NRW reduction in the	equipment in water	

			1
(1-6-2) Implement training on financial management for the sustainable operation of water supply service in consideration	pilot areas, Water quality analysis	treatment plant, pump	
of future development plans (e.g. general financial management, accounting, asset management, budget regulation, tariff	equipment, Equipment for water	station, and reservoir	
setting, PPP, etc.)	quality management, Flow meter and	site.	
(1-6-3) Conduct OJT on development of asset ledger	data logger for flow monitoring	To procure reagents for	
	system, Computers and printers,	the againment prograd	
(1-7) Strengthen Public Relations	Software, etc.	the equipment procured	
(1-7-1) Analyze the effective public relations on water service of YCDC		by Japanese side	
(1-7-2) Conduct awareness raising of YCDC staff	2 Oversees Training Program	(Japanese side will	
(1-7-3) Conduct OJT on the public relations activities	5. Overseas fraining frogram	provide necessary	
	I raining in Japan and/or neighboring	amount for 6th month	
(1-8) Strengthen human resources development	countries	after procurement and	
(1-8-1) Review the existing human resources development system		installation)	
(1-8-2) Identify necessary improvement on structure and materials of the trainings	4. Local cost	nistanation)	
(1-8-3) Conduct trainings of trainers for planning and organizing the trainings		• Non-revenue water	
(1-8-4) Develop 5-year and 10-year human resources development plans		To procure materials	
(1-8-5) Launch priority activities as a part of implementing the 5-year human resources development plan		which YCDC can	
		procure locally and	
(1-9) Develop and support implementation of the institutional management plans		routinely	
(1-9-1) Develop 5-year and 10-year institutional management plans		To secure storage space	
(1-9-2) Launch priority activities as a part of implementing the 5-year institutional management plan		for the equipment and	
2. Canacity of YCDC on NRW management is improved		not the equipment and	
- capacity of reperiod and an analysis of the second		materials procured	
(2-1) Establish NRW Management Unit		To conduct civil works	
(2-1-1) Establish NEW Management Unit		for construction of	
(2-1-2) Define the division of duties of NRW Management Unit		DMA (digging, piping,	
(2 · 2) Some and an anon of a large of the transmightent only		back-filling, and	
(2-2) Collect and compile information of NRW		restoration)	
(2-2-1) Collect information of NRW and implement a baseline survey		Collection of	
(2-2-2) Compile information of pipes for establishment of GIS		• Concetion of	
(2-2-3) Compile customer information into database		computerized data for	
(2-2-4) Formulate Standard Operation Procedure (SOP) of the above information management		Performance indicators	
		To deliver and	
(2-3) Develop a model on the management of physical loss (leakage, over flow) and human resources development		installation of all	
(2-3-1) Review current situation and develop phased countermeasures		provided equipment	
(2-3-2) Conduct trainings of trainers		(such as PCs) to each	
- Conduct trainings of trainers through implementation of Non-revenue water (NRW) pilot project in North		branch office	
Okkalapa		To secure space for	
(2-3-3) Prepare training plan and training materials by the trainers		installing DCs	
(2-3-4) Formulate manuals on physical loss		installing PCs	
(2-3-5) Conduct Off-JT by the trainers		> To procure	
(2-3-6) Select a pilot area for NRW management activities		consumables (including	
(2-3-7) Prepare action plan and procure equipment for the countermeasures to be taken for reducing physical loss in the		printer inks)	
pilot areas		To bear necessary	
(2-3-8) Set up DMAs at the pilot areas		operational costs for the	
(2-3-9) Conduct the countermeasures against physical loss in the pilot area		training	
(2-3-10) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model		To undate anti-virus	
of activities		Fito update anti-vitus	
(2-3-1) Implement OJ I by the trainers in the pilot area		software periodically	
(2-3-12) verify the manuals on physical loss		Civil work (construction	
		of flow meter chamber),	
(2-4) Develop a model on the management of commercial loss (meter fault, miss reading of meter, illegal connection) and		Safety fence for flow	

(24-1) Review current situation and develop phased countermeasures       interts and processing of trainers         (24-2) Conduct trainings of trainers       electricity supply for flow meter installation         (24-3) Prepare training plan and training materials by the trainers       electricity supply for flow meter installation         (24-4) Formulate manuals on commercial loss       electricity supply for flow meter installation         (24-4) Formulate manuals on commercial loss       electricity supply for flow meter installation         (24-4) Formulate manuals on commercial loss       electricity supply for flow meter installation         (24-4) Formulate manuals on commercial loss       flow for the countermeasures against commercial loss in the pilot area         (24-7) Conduct the countermeasures against commercial loss in the pilot area and formulate the optimal model of activities       electricity supply for flow meter installation         (24-4) Forduct the countermeasures against physical loss in the pilot area       electricity supply for flow meter installation         (24-7) Conduct the countermeasures against commercial loss in the pilot area       electricity supply for flow meter installation         (24-7) Divelop training yard for NRW management       electricity supply for flow meter installation         (2-5) Develop training yard       electricity supply for flow meter installation         (2-5) Optime equipment and materials for training yard       electricity supply for flow meter instrea         (2-5)
(24-2) Conduct trainings of trainers       electricity supply for flow         (24-2) Conduct trainings of trainers       meter installation         (24-3) Prepare training plan and training materials by the trainers       meter installation         (24-4) Formulate manuals on commercial loss       meter installation         (24-4) Conduct Of Trainers       Conduct Of Trainers         (24-4) Prepare training plan and training materials by the trainers       meter installation         (24-4) Conduct Of Trainers       Conduct Of Trainers         (24-4) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the selected pilot area       electricity supply for flow         (24-4) Conduct the countermeasures against commercial loss in the pilot area       electricity supply for flow         (24-4) Conduct the countermeasures against physical loss in the pilot area and formulate the optimal model of activities       electricity supply for flow         (2-4-9) Implement OIT by the trainers in the pilot area       electricity supply for flow         (2-5) Develop training yard for NRW management       electricity supply for flow         (2-5) Design training yard       electricity supply for flow         (2-5) Prepare training yard       electricity supply for flow         (2-5) Prepare training yard       electricity supply for flow         (2-5) Prepare training yard       electricity supply for flow     <
<ul> <li>(2 + 2) Conduct tunings of trainers through implementation of Non-revenue water (NRW) pilot project in North Okkalapa</li> <li>(2 + 4.3) Prepare training plan and training materials by the trainers</li> <li>(2 - 4.4) Formulate manuals on commercial loss</li> <li>(2 - 4.5) Conduct Off-JT by the trainers</li> <li>(2 - 4.6) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the selected pilot area</li> <li>(2 - 4.7) Conduct the countermeasures against commercial loss in the pilot area</li> <li>(2 - 4.7) Conduct the countermeasures against physical loss in the pilot area</li> <li>(2 - 4.9) Implement OJT by the trainers in the pilot area</li> <li>(2 - 4.9) Implement OJT by the trainers in the pilot area</li> <li>(2 - 4.9) Implement of NRW management</li> <li>(2 - 5.1) Prepare training plan for training yard</li> <li>(2 - 5.2) Design training yard</li> <li>(2 - 5.3) Prepare equipment and materials for training yard</li> <li>(2 - 5.3) Prepare equipment and materials for training yard and conduct trainings of the trainers in training yard</li> </ul>
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<ul> <li>(2-4-3) Prepare training plan and training materials by the trainers</li> <li>(2-4-4) Formulate manuals on commercial loss</li> <li>(2-4-5) Conduct Off-JT by the trainers</li> <li>(2-4-6) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the selected pilot area</li> <li>(2-4-7) Conduct the countermeasures against commercial loss in the pilot area</li> <li>(2-4-7) Conduct countermeasures against commercial loss in the pilot area</li> <li>(2-4-7) Conduct countermeasures against physical loss in the pilot area</li> <li>(2-4-9) Implement OJT by the trainers in the pilot area</li> <li>(2-4-9) Implement OJT by the trainers in the pilot area</li> <li>(2-4-10) Verify the manuals on commercial loss</li> </ul>
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<ul> <li>(2-4-9) Interference of Foy the trainers in the pilot area</li> <li>(2-4-10) Verify the manuals on commercial loss</li> <li>(2-5) Develop training yard for NRW management</li> <li>(2-5-1) Prepare training yard</li> <li>(2-5-2) Design training yard</li> <li>(2-5-3) Prepare equipment and materials for training yard</li> <li>(2-5-4) Construct training manuals and materials for training yard and conduct trainings of the trainers in training yard</li> </ul>
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(2-5-5) Prepare training manuals and materials for training yard and conduct trainings of the trainers in training yard
(2-3-3) I repare training manuals and materials for training yard and conduct trainings of the training yard
(2.5.6) Conduct Off IT by the trainers in training word
(2-5-6) Conduct On-51 by the training yard
(2-6) Develop and support implementation of the NRW management plans
(2-6) Develop and support implementation of the UKW management plans
(2-6-1) Develop by Cear and To-Year NWW management plan
(2-0-2) Lauren priority activities as a part of implementing the 3-year NKW management plan
3. Conscituted VCDC on water quality management is improved
b. Capacity of 1 CDC on water quarty management is improved.
(3-1) Establish Water Treatment Section
(3-1) Establish Water Treatment Section in Department of Water and Sanitation
(3-1-1) Define the division of during of the Weter Treatment Section
(3-1-3) Hold as earlies of senior for basic water frequent technology with study tours
(5-1-5) Hold a series of series of series of series when the annotation of the series of series
(3-2) Review current situation and formulate phased countermeasures
(3-3) Conduct training of trainers on water quality management
(3-3-1) Conduct training of trainers on the water quality management
(3-3-2) Prenare the training plan and training materials by the trainers
(3-3-3) Conduct Off-IT by the trainers
(3-4) Develop SOP for water quality management
(3-4-1) Develop SOP on water quality test and monitoring
(3-4-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility
(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility
(3-5-1) Procure water quality analysis and water quality management equipment
(3-5-2) Conduct OJT on water quality test and monitoring
(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant
(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin
(3-5-5) Prepare an improvement plan of Nyaunghnapin water treatment plant

(3-5-6) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility (3-5-7) Verify SOP for water quality management	
<ul> <li>(3-6) Conduct OJT on improvement of water quality supplied from reservoirs</li> <li>(3-6-1) Review water quality problems in reservoir water</li> <li>(3-6-2) Research water quality improvement measure of reservoir suppled water</li> </ul>	
<ul> <li>(3-7) Develop and support implementation of the water quality management plans</li> <li>(3-7-1) Develop 5-year and 10-year water quality management plans</li> <li>(3-7-2) Launch priority activities as a part of implementing 5-year water quality management plan</li> </ul>	

<sup>1</sup> PIs and their baseline data will be set approximately 1 to 2 year(s) after the Project commencement. Considering the monitoring results of PIs, target values of respective PIs will be discussed within the Project and decided by JCC.

Project Name	: The Project for Improvement of Water Supply Management of YCDC (PDM Ver.4)
Executing Agency	: Yangon City Development Committee (hereinafter referred to as "YCDC")
Project Sites	: Greater Yangon
Target Group	: Staff of YCDC
Direct beneficiaries	: Staff of YCDC
Indirect Beneficiaries	: People living in the water supply areas of YCDC

Duration of the Project: 5.5 years (5<sup>th</sup> July 2015 to the end of December 2020) PDM Version 4 (June 2020)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important
Natrative Summary	Objectively vermable indicator	Means of Vermeation	Assumptions
[Overall Goal] Water supply services provided by YCDC are enhanced.	<ol> <li>The management key performance indicators (MKPIs) are improved compared to the data at the Project commencement<sup>1</sup>.</li> <li>NRW is decreased from OO % to OO % in the water supply area of YCDC.</li> <li>The compliance ratio in terms of turbidity to meet the water quality standard is increased from OO% to OO%. The compliance ratio is increased from OO% to OO% in terms of residual chlorine (&gt;0.2 mg/l).</li> </ol>	<ol> <li>S/C2 activity record, MKPIs monitoring sheets.</li> <li>S/C1 activity record, MKPIs monitoring sheets.</li> <li>Water quality monitoring report, MKPIs monitoring sheets.</li> </ol>	
[Project Purpose]			YCDC will obtain
Capacity of YCDC on the management of water supply service is improved.	1. Steering Committees (S/C) are organized and improvement actions are implemented.	1. Appointment letter for S/C members, S/C1, 2, 3 activity record.	construction and rehabilitation of
	2. Mid-term management plan is approved by EDWS.	2. Approval of Mid-term management plan in S/C2, or approval letter of the Head of Department (CE).	water treatment
	3. The implementation of mid-term management plan is monitored based on MKPIs.	3. MKPIs monitoring sheets.	facility and
	4. The NRW ratio is grasped in the water supply service area of YCDC and monitored.	4. NRW management report.	distribution pipes,
	5. Plan for NRW reduction is approved by EDWS.	5. Approval of Plan for NRW reduction in S/C1, or approval letter of CE.	etc.
	6. Water quality is grasped in the water supply service area of YCDC and monitored.	6. Monthly water quality monitoring report.	
	7. Plan for improvement of water quality is approved by EDWS.	7. Approval of Plan for improvement of water quality in S/C2, or approval letter of CE.	
[Outputs]			
<ol> <li>Capacity of YCDC on institutional management of water supply utility is improved.</li> </ol>	1-1 Plan for improvement of water bill collection is approved by EDWS.	1-1 Approval in S/C2, or approval letter of CE.	
	1-2 Plan for human resources development is approved by EDWS.	1-2 Approval in S/C2, or approval letter of CE.	]
	1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by EDWS.	1-3 Approval in S/C3, or approval letter of CE.	
	1-4 New organization structure is approved by Mayor.	1-4 Approval letter, or approval process confirmed by the Experts.	
	1-5 2 Full time staff members in Planning Section can give direction of PDCA cycle to EDWS staff.	1-5 Evaluation by JICA Experts based on duties of Management Planning Unit in Planning Section in Report on Institutional Reorganization.	
2. Capacity of YCDC on NRW management is improved.	2-1 Manuals and training materials on NRW management are utilized by YCDC staff.	2-1 Manuals in relevant offices and training record.	
	2-2 Information of customers and pipes for the pilot areas is compiled and updated.	2-2 Pilot project activity report.	1
	2-3 The number of trainers for NRW management becomes 8.	2-3 S/C1 activity record, Evaluation by JICA Experts based on a check sheet indicating necessary abilities for trainers. The check list to be prepared in the project in advance.	

3. Capacity of YCDC on water quality management is improved.	<ul> <li>2-4 EDWS staff participates in training based on training plan for NRW mana.</li> <li>2-5 NRW ratio is decreased to 25% in the pilot area.</li> <li>3-1 Manuals and training materials on water quality management are fully util</li> <li>3-2 Result of the water quality test by the central laboratory and on-site mini I and monitored periodically.</li> <li>3-3 The number of trainers for water quality management becomes 4.</li> <li>3-4 EDWS staff participates in training based on training plan for water qualit</li> <li>3-5 The turbidity of treated water in pilot sand filter in Nyaunghnapin water the controlled less than 1 NTU.</li> <li>3-6 The operation and maintenance system of Lagunbyin water treatment plan</li> <li>3-7 The operation and maintenance system of chlorination facilities is prepared</li> </ul>	gement. lized by YCDC staff. aboratory is recorded ry management. reatment plant is it is prepared.	<ul> <li>2-4 Training attend Section)</li> <li>2-5 S/C1 activity re</li> <li>3-1 S/C3 monitorin offices, training rec</li> <li>3-2 Monthly water</li> <li>3-3 Evaluation by J sheet indicating net check list to be pre</li> <li>3-4 Training attend Section).</li> <li>3-5 Activity report</li> <li>3-6 Operation and structure of Lagund</li> <li>3-7 Operation and participation</li> </ul>	ance record, HRD report (HRD ecord, Pilot project activity report. ag report, manuals in relevant cord. quality monitoring report. IICA Experts based on a check cessary abilities for trainers. The pared in the project in advance. ance record, HRD report (HRD of Taskforce team. maintenance organization oyin water treatment plant. maintenance organization	
Activities	<u> </u>	1	structure of chlorin	ation facilities.	
1. Canacity of VCDC on institutional managem	nant of water supply utility is improved	Japanese side		Myanmar side	[Pre-condition]
<ul> <li>(1-1) Prepare overall new organization structure</li> <li>(1-2) Establish the Planning Section <ul> <li>(1-2-1) Establish the Planning Section in Ded</li> <li>(1-2-1) Establish the Planning Section in Ded</li> <li>(1-2-2) Define the division of duties of the F</li> </ul> </li> <li>(1-3) Establish Customer Service Division <ul> <li>(1-3-1) Establish the Customer Service Dividition of duties of the Customer Service Dividition of the Service Dividition (1-5-2) Identify regulation, standards and gu (1-5-4) Draft necessary regulation, standard and material standards for distribution pipes</li> </ul></li></ul>	e spartment of Water and Sanitation Planning Section ision in Department of Water and Sanitation Customer Service Division istomer Service Division ttors (PIs) lation and monitoring of performance data alculation and monitoring of Performance Indicators. Performance Indicators to be monitored (e.g. water supply ratio, water supply data logger and collect flow data ters, software, etc.) in local offices and conduct training Is and monitoring system of Performance Indicators s e Indicators periodically idelines ns, standards and guidelines sidelines to be modified and/or newly formulated in a trial s and guidelines, which can be prepared by YCDC (e.g. design, construction s, service pipes and meters, tariff collection manuals, guidelines of tariff setting)	<ol> <li>Experts         <ol> <li>Consultant tear                 <ul> <li>Chief Advisor /' Operation</li></ul></li></ol></li></ol>	m Water Supply bacity Development irces Management itoring ness Management- l Loss) cial Loss) Maintenance of Facilities Management ation vaterworks agement (Planning, Management, ard/Guideline, PR, , NRW W Engineering, , Tariff Collection), nagement (Water ering, Water Quality	<ol> <li>Counterpart personnel</li> <li>Office space and facilities</li> <li>Necessary data/ information</li> <li>Local cost for implementation of the activities</li> <li>Distribution flow monitoring</li> <li>To design and construct chambers for flow meters</li> <li>To take security measures (constructing gates and fences for flow meters and other accessories)</li> <li>To supply electricity to the site</li> <li>Water quality monitoring</li> <li>To secure space in laboratory in Head Office for equipment procured.</li> <li>To allocate space for equipment in water treatment plant, pump station, and reservoir site.</li> <li>To procure reagents for</li> </ol>	1. Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management

		1	L
	Water leakage detector, Equipment	the equipment procured	
(1-6) Enhance understanding on financial management	and material for NRW reduction in the	by Japanese side	
(1-6-1) Analyze the current financial management system	pilot areas, Water quality analysis	(Japanese side will	
(1-6-2) Implement training on financial management for the sustainable operation of water supply service in consideration	equipment, Equipment for water	provide necessary amount	
of future development plans (e.g. general financial management, accounting, asset management, budget regulation, tariff	quality management, Flow meter and	for 6 <sup>th</sup> month after	
setung, Prr, etc.)	data logger for flow monitoring	procurement and	
(1-6-3) Conduct OJT on development of asset redger	Software, etc.	production and	
(1.7) Steparthan Public Polotions	Software, etc.	installation)	
(1-7) Stellguen Fuorie Relativa sublic relations on water service of VCDC		<ul> <li>Non-revenue water</li> </ul>	
(17/-1) Analyze the effective public relations of water service of TEDE	3. Overseas Training Program	To procure materials	
(1-7-2) Conduct AWACHESS raising of TCDC start (1-7-3) Conduct OIT on the public relations activities	Training in Japan and/or neighboring	which YCDC can procure	
(1-7-5) Conduct OST on the public relations activities	countries	locally and routinely	
(1-8) Strengthen human resources development		> To secure storage space	
(1.8.1) Review the existing human resources development system		for the equipment and	
(1-5-) Identify necessary improvement on structure and materials of the trainings	4. Local cost	for the equipment and	
(1-8-3) Conduct trainings of trainers for planning and organizing the trainings		materials procured	
(1-8-4) Develop S-year and 10-year human resources development plans		To conduct civil works for	
(1-8-5) Laurch priority activities as a part of implementing the 5-year human resources development plan		construction of DMA	
(1 0 5) Zuanen protiky acativace as a part of implementing are 5 year namen resources development plan		(digging, piping,	
(1-9) Develop and support implementation of the institutional management plans		back-filling, and	
(1-9-1) Develop 5-year and 10-year institutional management plans		restoration)	
(1-9-2) Launch priority activities as a part of implementing the 5-year institutional management plan		Collection of computerized	
		data fan Danfamaan as	
(1-10) Conduct the support activities in response to the COVID-19 emergency		data for Performance	
		indicators	
		To deliver and installation	
2. Capacity of YCDC on NRW management is improved.		of all provided equipment	
		(such as PCs) to each	
(2-1) Establish NRW Management Unit		branch office.	
(2-1-1) Establish NRW Management Unit		To secure space for	
(2-1-2) Define the division of duties of NRW Management Unit		installing PCs	
		To ano sumo con sumo chico	
(2-2) Collect and compile information of NRW			
(2-2-1) Collect information of NRW and implement a baseline survey		(including printer inks)	
(2-2-2) Compile information of pipes for establishment of GIS		To bear necessary	
(2-2-3) Compile customer information into database		operational costs for the	
(2-2-4) Formulate Standard Operation Procedure (SOP) of the above information management		training	
		➤ To update anti-virus	
(2-3) Develop a model on the management of physical loss (lackage, over flow) and numan resources development		software periodically	
(2-5-1) Review current singulation and develop phased countermeasures		• Civil work (construction of	
(2-3-2) Conduct trainings of trainers		Civil work (construction of	
- Conduct trainings of trainers through implementation of Non-revenue water (NKW) pilot project in North		flow meter chamber), Safety	
Orkalapa		fence for flow meters and	
(2-3-5) repare training pran and training materials by the trainers		panels, and electricity	
(2-3-4) Formulae manuals on physical loss		supply for flow meter	
(2-3-3) conduct O(1-3) by the trainers		installation	
(2-3-9) select a prior area for investmant for the countermassures to be taken for reducing abusing lacs in the			
(2-3-1) repart action plan and procure equipment for the countermeasures to be taken for reducing physical loss in the			
(2.3.8) Set up DMAs at the pilot areas			
$(2-5^{\circ})$ Soft up Divises at the pilot areas $(2-5^{\circ})$ Conduct the contractment areas $(2-5^{\circ})$ Conduct the contractment areas against physical loss in the pilot area			
(2-3-3) Conduct the countermeasures against physical loss in the phot area			1

(2-3-10) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model of activities		
(2-3-11) Implement OJT by the trainers in the pilot area		
(2-3-12) Verify the manuals on physical loss		
(2.4) Develop a model on the management of commercial loss (motor fault mice reading of motor illogal connection) and		
(2-4) Develop a model on the management of commercial loss (meter fault, miss reading of meter, filegal connection) and human resources development		
(2-4-1) Review current situation and develop phased countermeasures		
(2-4-2) Conduct trainings of trainers		
- Conduct trainings of trainers through implementation of Non-revenue water (NRW) pilot project in North Okkalana		
(2-4-3) Prepare training plan and training materials by the trainers		
(2-4-4) Formulate manuals on commercial loss		
(2-4-5) Conduct Off-JT by the trainers		
(2-4-6) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the		
selected pilot area		
(2-4+3) Evaluate cost-benefit of countermeasures against connected how in the pilot area and formulate the optimal model of		
(2 · 6) of many cost concerned of countermeasures against physical loss in the physical cost of many comparison in the physical cost of		
(2-4-9) Implement OJT by the trainers in the pilot area		
(2-4-10) Verify the manuals on commercial loss		
(2-5) Develop training yard for NKW management		
(2-5-1) I repare training part for training yard (2-5-2) Design training yard		
(2-5-3) Prepare equipment and materials for training yard		
(2-5-4) Construct training yard		
(2-5-5) Prepare training manuals and materials for training yard and conduct trainings of the trainers in training yard		
(2-5-6) Conduct Off-JT by the trainers in training yard		
(2-6) Develop and support implementation of the NRW management plans		
(2-6-1) Develop 5-year and 10-year NRW management plans		
(2-6-2) Launch priority activities as a part of implementing the 5-year NRW management plan		
3. Capacity of YCDC on water quality management is improved.		
(3.1) Establish Water Transforment Section		
(3-1-1) Establish Water Treatment Section in Department of Water and Sanitation		
(3-1-2) Define the division of duties of the Water Treatment Section		
(3-1-3) Hold a series of seminar for basic water treatment technology with study tours		
(3-2) Review current situation and formulate phased countermeasures		
(3-3) Conduct training of trainers on water quality management		
(3-3-1) Conduct training of trainers on the water quality management		
(3-3-2) Prepare the training plan and training materials by the trainers		
(3-3-3) Conduct Off-JT by the trainers		
(2.4) Develop SOD for write anality means and		
(3-4-1) Develop SOP for water quality management		
(3-4-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility		

(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility	
(3-5-1) Procure water quality analysis and water quality management equipment	
(3-5-2) Conduct OJT on water quality test and monitoring	
(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant	
(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin	
(3-5-5) Prepare an improvement plan of Nyaunghnapin water treatment plant	
(3-5-6) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility	
(3-5-7) Verify SOP for water quality management	
<ul> <li>(3-6) Conduct OJT on improvement of water quality supplied from reservoirs</li> <li>(3-6-1) Review water quality problems in reservoir water</li> <li>(3-6-2) Research water quality improvement measure of reservoir suppled water</li> </ul>	
(3-7) Develop and support implementation of the water quality management plans	
(3-7-1) Develop 5-year and 10-year water quality management plans	
(3-7-2) Launch priority activities as a part of implementing 5-year water quality management plan	

<sup>1</sup> PIs and their baseline data will be set approximately 1 to 2 year(s) after the Project commencement. Considering the monitoring results of PIs, target values of respective PIs will be discussed within the Project and decided by JCC.

Project Name: The Project for Improvement of Water Supply Management of YCDC (PDM Ver.5)Executing Agency: Yangon City Development Committee (hereinafter referred to as "YCDC")Project Sites: Greater YangonTarget Group: Staff of YCDCDirect beneficiaries: Staff of YCDCIndirect Beneficiaries: People living in the water supply areas of YCDC

Duration of the Project: 5 years and 11 months (5<sup>th</sup> July 2015 to 4<sup>th</sup> June 2021) PDM Version 5 (November 2020)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumptions
[Overall Goal] Water supply services provided by YCDC are enhanced.	<ol> <li>The management key performance indicators (MKPIs) are improved compared to the data at the Project commencement<sup>1</sup>.</li> <li>NRW is decreased from OO % to OO % in the water supply area of YCDC.</li> <li>The compliance ratio in terms of turbidity to meet the water quality standard is increased from OO% to OO%. The compliance ratio is increased from OO% to OO% in terms of residual chlorine (&gt;0.2 mg/l).</li> </ol>	<ol> <li>S/C2 activity record, MKPIs monitoring sheets.</li> <li>S/C1 activity record, MKPIs monitoring sheets.</li> <li>Water quality monitoring report, MKPIs monitoring sheets.</li> </ol>	
[Project Purpose]			YCDC will obtain external funds for
Capacity of YCDC on the management of water supply service is improved.	1. Steering Committees (S/C) are organized and improvement actions are implemented.	1. Appointment letter for S/C members, S/C1, 2, 3 activity record.	construction and rehabilitation of
	2. Mid-term management plan is approved by EDWS.	2. Approval of Mid-term management plan in S/C2, or approval letter of the Head of Department (CE).	water treatment plant, disinfection facility and
	3. The implementation of mid-term management plan is monitored based on MKPIs.	3. MKPIs monitoring sheets.	distribution pipes,
	4. The NRW ratio is grasped in the water supply service area of YCDC and monitored.	4. NRW management report.	etc.
	5. Plan for NRW reduction is approved by EDWS.	5. Approval of Plan for NRW reduction in S/C1, or approval letter of CE.	
	6. Water quality is grasped in the water supply service area of YCDC and monitored.	6. Monthly water quality monitoring report.	1
	7. Plan for improvement of water quality is approved by EDWS.	7. Approval of Plan for improvement of water quality in S/C2, or approval letter of CE.	-
[Outputs]			
1. Capacity of YCDC on institutional management of water supply utility is improved.	1-1 Plan for improvement of water bill collection is approved by EDWS.	1-1 Approval in S/C2, or approval letter of CE.	•
	1-2 Plan for human resources development is approved by EDWS.	1-2 Approval in S/C2, or approval letter of CE.	1
	1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by EDWS.	1-3 Approval in S/C3, or approval letter of CE.	-
	1-4 New organization structure is approved by Mayor.	1-4 Approval letter, or approval process confirmed by the Experts.	
	1-5 2 Full time staff members in Planning Section can give direction of PDCA cycle to EDWS staff.	1-5 Evaluation by JICA Experts based on duties of Management Planning Unit in Planning Section in Report on Institutional Reorganization.	
2. Capacity of YCDC on NRW management is improved.	2-1 Manuals and training materials on NRW management are utilized by YCDC staff.	2-1 Manuals in relevant offices and training record.	
	2-2 Information of customers and pipes for the pilot areas is compiled and updated.	2-2 Pilot project activity report.	

	<ul> <li>2-3 The number of trainers for NRW management becomes 8.</li> <li>2-4 EDWS staff participates in training based on training plan for NRW no.</li> <li>2-5 NRW ratio is decreased to 25% in the pilot area.</li> </ul>	management.	2-3 S/C1 activity Experts based on necessary abilitic prepared in the p 2-4 Training atter Section) 2-5 S/C1 activity report.	record, Evaluation by JICA a check sheet indicating es for trainers. The check list to be roject in advance. Indance record, HRD report (HRD record, Pilot project activity	
3. Capacity of YCDC on water quality management is improved.	3-1 Manuals and training materials on water quality management are full staff.	ly utilized by YCDC	offices, training r	ring report, manuals in relevant ecord.	
	3-2 Result of the water quality test by the central laboratory and on-site r recorded and monitored periodically.	nini laboratory is	3-2 Monthly wat	er quality monitoring report.	
	3-3 The number of trainers for water quality management becomes 4.		3-3 Evaluation by sheet indicating r The check list to advance.	y JICA Experts based on a check necessary abilities for trainers. be prepared in the project in	
	3-4 EDWS staff participates in training based on training plan for water of	quality management.	3-4 Training atter Section).	ndance record, HRD report (HRD	
	3-5 The turbidity of treated water in pilot sand filter in Nyaunghnapin wa controlled less than 1 NTU.	ater treatment plant is	3-5 Activity repo	rt of Taskforce team.	
	3-6 The operation and maintenance system of Lagunbyin water treatmen	t plant is prepared.	3-6 Operation an structure of Lagu	d maintenance organization	
	3-7 The operation and maintenance system of chlorination facilities is pr	epared.	3-7 Operation an structure of chlor	d maintenance organization ination facilities.	
[Activities]			[Inpu	ts]	
1. Capacity of YCDC on institutional management	of water supply utility is improved.	Japanese side		<u>Myanmar side</u>	[Pre-condition]
<ul> <li>(1-1) Prepare overall new organization structure</li> <li>(1-2) Establish the Planning Section</li> <li>(1-2-1) Establish the Planning Section in Departs</li> <li>(1-2-2) Define the division of duties of the Plann</li> <li>(1-3) Establish Customer Service Division</li> <li>(1-3-1) Establish the Customer Service Division</li> <li>(1-3-2) Define the division of duties of the Custor</li> <li>(1-3-3) Establish operation system of the Custor</li> <li>(1-4) Develop and Monitor Performance Indicators</li> <li>(1-4-1) Review the current method of calculation</li> <li>(1-4-2) Conduct training of trainers on the calcul</li> <li>(1-4-3) Identify the important and available Performance, NRW, etc.)</li> <li>(1-4-4) Install transmission flow meter and data</li> <li>(1-4-5) Procure equipment (computers, printers, (1-4-6) Collect data required for setting Pls</li> <li>(1-4-7) Develop calculation method, manuals an</li> <li>(1-4-8) Calculate the Performance Indicators</li> <li>(1-4-9) Update and monitor the Performance Indicators</li> </ul>	ment of Water and Sanitation ing Section in Department of Water and Sanitation omer Service Division ner Service Division (PIs) and monitoring of performance data ation and monitoring of Performance Indicators. ormance Indicators to be monitored (e.g. water supply ratio, water supply logger and collect flow data software, etc.) in local offices and conduct training d monitoring system of Performance Indicators icators periodically	<ol> <li>Experts         <ol> <li>Consultant team</li> <li>Chief Advisor / Wa Operation</li> <li>Institutional Capace / Human Resource</li> <li>Planning / Monitor</li> <li>Financial / Businee NRW (Physical L</li> <li>NRW (Commercia</li> <li>GIS</li> <li>Operation and Mai Water Supply Face</li> <li>Water Quality Mar</li> <li>Project Coordination</li> <li>2) Experts from wat Institutional Manage Finance/Business Mir Regulation/Standard Human Resource), N</li> </ol> </li> </ol>	tter Supply ity Development es Management ing is Management- oss) I Loss) ntenance of ilities lagement on erworks ment (Planning, anagement, (Guideline, PR, [RW Engineering,	<ol> <li>Counterpart personnel</li> <li>Office space and facilities</li> <li>Necessary data/ information</li> <li>Local cost for implementation of the activities</li> <li>Distribution flow monitoring</li> <li>To design and construct chambers for flow meters</li> <li>To take security measures (constructing gates and fences for flow meters and other accessories)</li> <li>To supply electricity to the site</li> <li>Water quality monitoring</li> <li>To secure space in laboratory in Head Office</li> </ol>	1. Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management

	Customer Service, Tariff Collection),	for equipment procured.	
(1-5) Formulate regulations, standards and guidelines	Water Quality Management (Water	> To allocate space for	
(1-5-1) Review the existing rules, regulations, standards and guidelines	Treatment Engineering, Water Quality	equipment in water	
(1-5-2) Identify regulation, standards and guidelines to be modified and/or newly formulated	Engineering)	treatment plant, pump	
(1-5-3) Draft water supply regulation and run a trial		station and reservoir site	
(1-3-4) Drain necessary regulation, standards and guidelines, which can be prepared by 1CDE (c.g. design, construction and material standards for distribution pines, service pines and maters tariff callection manuals, guidelines of tariff setting)	2. Equipment	To procure reagents for	
and material standards for distribution pipes, so vice pipes and meters, tarm concerton manuals, guidennes or tarm setting)	Water leakage detector, Equipment	the equipment procured	
(1-6) Enhance understanding on financial management	and material for NRW reduction in the	by Japanese side	
(1-6-1) Analyze the current financial management system	pilot areas, Water quality analysis	(Japanese side will	
(1-6-2) Implement training on financial management for the sustainable operation of water supply service in consideration	equipment, Equipment for water	(Japanese side will	
of future development plans (e.g. general financial management, accounting, asset management, budget regulation, tariff	quality management, Flow meter and	for 6 <sup>th</sup> month after	
setting, PPP, etc.)	system. Computers and printers		
(1-6-3) Conduct OJI on development of asset ledger	Software etc	procurement and	
(1-7) Strengthen Public Pelations	boltware, etc.	installation)	
(1-7-1) Analyze the effective public relations on water service of YCDC		• Non-revenue water	
(1-7-2) Conduct awareness raising of YCDC staff	3. Overseas Training Program	> To procure materials	
(1-7-3) Conduct OJT on the public relations activities	Training in Japan and/or neighboring	which YCDC can procure	
	countries	locally and routinely	
(1-8) Strengthen human resources development		To secure storage space	
(1-8-1) Review the existing human resources development system	4. Local cost	for the equipment and	
(1-8-2) Identify necessary improvement on structure and materials of the trainings		materials procured	
(1-8-3) Conduct trainings of trainers for planning and organizing the trainings		To conduct civil works for	
(1-6-4) Develop 5-year and to-year numan resources development plans (1-8-5) Launch priority activities as a part of inplementing the 5-year human resources development plan		construction of DMA	
		(digging, piping,	
(1-9) Develop and support implementation of the institutional management plans		back-filling, and	
(1-9-1) Develop 5-year and 10-year institutional management plans		restoration)	
(1-9-2) Launch priority activities as a part of implementing the 5-year institutional management plan		<ul> <li>Collection of computerized</li> </ul>	
		data for Performance	
(1-10) Conduct the support activities in response to the COVID-19 emergency		indicators	
		To deliver and installation	
2. Capacity of YCDC on NRW management is improved.		of all provided equipment	
		(such as PCs) to each	
(2-1) Establish NRW Management Unit		branch office.	
(2-1-1) Establish NKW Management Unit		➤ To secure space for	
(2-1-2) Define the division of duties of NKW Management Unit		installing PCs	
(2-2) Collect and compile information of NRW		> To procure consumables	
(2-2-1) Collect information of NRW and implement a baseline survey		(including printer inks)	
(2-2-2) Compile information of pipes for establishment of GIS		> To bear necessary	
(2-2-3) Compile customer information into database		operational costs for the	
(2-2-4) Formulate Standard Operation Procedure (SOP) of the above information management		training	
		➤ To update anti-virus	
(2-3) Develop a model on the management of physical loss (leakage, over flow) and human resources development		software periodically	
(2-3-1) Conduct trainings of trainers		Civil work (construction of	
- Conduct trainings of trainers through implementation of Non-revenue water (NRW) pilot project in North		flow meter chamber), Safety	
Okkalapa		fence for flow meters and	
(2-3-3) Prepare training plan and training materials by the trainers		panels, and electricity	

(2-3-4) Formulate manuals on physical loss	supply for flow meter	
(2-3-5) Conduct Off-JT by the trainers	installation	
(2-3-6) Select a pilot area for NRW management activities	Installation	
(2-3-7) Prepare action plan and procure equipment for the countermeasures to be taken for reducing physical loss in the		
pilot areas		
(2-3-8) Set up DMAs at the pilot areas		
(2-3-9) Conduct the countermeasures against physical loss in the pilot area		
(2-3-10) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model		
of activities		
(2-3-11) Implement OJT by the trainers in the pilot area		
(2-3-12) Verify the manuals on physical loss		
(2-4) Develop a model on the management of commercial loss (meter fault, miss reading of meter, illegal connection) and		
human resources development		
(2-4-1) Review current situation and develop phased countermeasures		
(2-4-2) Conduct trainings of trainers		
- Conduct trainings of trainers through implementation of Non-revenue water (NKW) pilot project in North		
OKKalapa		
(2-4+5) repare training plan and training materials by the trainers		
(2-4+4) romutate manuals on commercial loss		
(2-4-5) Conduct on (2-4-5) by the dathers $(2-4-5)$ (2-4-6) proper eaction plan and procurement of equipment for the countermeasures to be taken for commercial loss in the		
(2 + 6) replace target in the production of equipment for the countermeasures to be taken for commercial ross in the selected nilot area		
(2-4-7) Conduct the countermeasures against commercial loss in the nilot area		
(2-4-8) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model of		
activities		
(2-4-9) Implement OJT by the trainers in the pilot area		
(2-4-10) Verify the manuals on commercial loss		
(2-5) Develop training yard for NRW management		
(2-5-1) Prepare training plan for training yard		
(2-5-2) Design training yard		
(2-5-3) Prepare equipment and materials for training yard		
(2-5-4) Construct training yard		
(2-5-5) repare training manuals and materials for training yard and conduct trainings of the trainers in training yard		
(2-5-6) Conduct On-51 by the training yard		
(2-6) Develop and support implementation of the NRW management plans		
(2-6-1) Develop 5-year and 10-year NRW management plans		
(2-6-2) Launch priority activities as a part of implementing the 5-year NRW management plan		
3. Capacity of YCDC on water quality management is improved.		
(3-1) Establish Water Treatment Section		
(3-1-1) Establish Water Treatment Section in Department of Water and Sanitation		
(3-1-2) Define the division of duties of the Water Treatment Section		
(3-1-3) Hold a series of seminar for basic water treatment technology with study tours		
(5-2) Review current situation and formulate phased countermeasures		
(3.3) Conduct training of trainers on water quality management		
(3.3.1) Conduct training of trainers on the uster quality management		
(5-5-1) Conduct daming of damers on the water quarty management		1

(3-3-2) Prepare the training plan and training materials by the trainers (3-3-3) Conduct Off-JT by the trainers		
(3-4) Develop SOP for water quality management		
(3-4-1) Develop SOP on water quality test and monitoring (3-4-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility		
<ul> <li>(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility</li> <li>(3-5-1) Procure water quality analysis and water quality management equipment</li> <li>(3-5-2) Conduct OJT on water quality test and monitoring</li> <li>(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant</li> <li>(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin</li> <li>(3-5-5) Prepare an improvement plan of Nyaunghnapin water treatment plant</li> <li>(3-5-6) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility</li> <li>(3-5-7) Verify SOP for water quality management</li> </ul>		
<ul> <li>(3-6) Conduct OJT on improvement of water quality supplied from reservoirs</li> <li>(3-6-1) Review water quality problems in reservoir water</li> <li>(3-6-2) Research water quality improvement measure of reservoir suppled water</li> </ul>		
(3-7) Develop and support implementation of the water quality management plans		
(3-7-2) Launch priority activities as a part of implementing 5-year water quality management plan		
<sup>1</sup> PIs and their baseline data will be set approximately 1 to 2 year(s) after the Project commencement. Considering the monitorin	g results of PIs, target values of respective PIs will be discussed within the Proje	ct and decided by JCC.

資料-2: 業務フローチャート

## 2. Work Flowsheet

(1) Output 1

3 69 70 71 72	2021		3 4 5 6							)		<b>1</b>								ſ					1				
55 56 57 58 59 60 61 62 63 64 65 66 67 68	2020		1 2 3 4 5 6 7 8 9 10 11 12 1 2						-		-			n a trial	prepared by YCDC	ſ		t plans			-			-	_	nt plans	-year human resources development plan		Inity activities as a part of implementing the 5- ser institutional management plan
8 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54	2019	Term 2	8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 12			ablish operation system of the Customer Service Divisio	tion and monitoring of Performance Indicators.		ission flow meter and data logger and collect flow data		d monitoring system of Performance Indicators	formance Indicators	nitor the Performance Indicators periodically	<ol> <li>Draft water supply regulation and ru</li> </ol>	ssary regulation, standards and guidelines, which can be		nent style suitabe for Myanmar)	ater supply service in consideration of future development	3. Conduct OJT on development of asset ledger		duct awareness raising of YCDC staff	tot OJT on the public relations activities		srs for planning and organizing the trainings		evelop 5-year and 10-year human resources developme	Launch priority activities as a part of implementing the	1 Develope E user and 40 user institutional memory	2. Launch priver and regret mountainer from priver
1 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 3	2017 2018		3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8			3. Est	2. Conduct training of trainers on the calcula	liable Performance Indicators	4. Install transm	6. Collect data required for setting PIs	7. Develop calculation method, manuals and	8. Calculate Perf	9.Update and mo		nodified and/or 4. Draft nece		ement system (Study on sustainable water utility managen	i financial management for the sustainable operation of we			2. Conc	3. Condu		3. Conduct trainings of traine	ructure and	4. D	2		
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 2	2015 2016	Term 1	9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2	1. Prepare overall new organization structure	1. Establish the Planning Section 2. Define the division of duties of the Planning Secrition	1. Oustomer Service Division     2. Define the division of duties     of the Customer Service	. Review the current performance data	3. Identify the necessary and ava			-			Review the existing rules, regulations	2. Identify regulation, standards and guidelines to be n power formulated		1. Analyze the current financial manag	2. Implement training or		1 Analyze the effective public relations			<ul> <li>Design the adopted human second deviation</li> </ul>		<ol><li>Identify necessary improvement on training st</li></ol>				
1 2	Year	Activity	Month 7 8	1.1 Prepare Overall New Organization Structure	1.2 Establish Planning Section	1.3 Establish Oustomer Service Division		J		1.4 Develop and Monitor Performance Indicators (PIs)			It 1: tv of	on imal in the second se	ement standards and guidelines		1.6 Enhance understanding	on financial management			1.7 Strengthen Public	Kelations			1.8 Strengthen human	resources development		1.9 Develop and support	Implementation of the institutional management rolans
													Output 1: Canacity of	YCDC on	manageme is improved														

	Year Activity Month	7 2015 2015 7 8 9 10 11 12 1	8 9 10 11 12 13 14 15 16 17 18 2016 <b>Term</b> 1 2 3 4 5 6 7 8 9 10 11 12	19 20 21 22 23 24 25 26 27 28 29 3 2017 2 2 3 4 5 6 7 8 9 10 11 12	0 31 32 33 34 35 36 37 38 39 40 41 42 2018 2 1 2 3 4 5 6 7 8 9 10 11 12	43 44 45 46 47 48 49 50 51 52 2019 <b>Term 2</b> 1 2 3 4 5 6 7 8 9 10	[53] 54     56     57     58     56     67     58     69     61     82     68     67     68     67     68     67     68     67     68     67     68     67     68     67     68     67     68     67     68     67     68     67     68     67     68     78     9     10     11     12     1     2     3	39 70 71 2021 3 4 5
	2.1 Establish NRW Management Unit	2. Define	1. Establish NRWManagement Unit the division of duties of NRWManage	ment Unit				
				1. Collect information of NRW and in	mplement a baseline survey			
	2.2 Collect and compile information of NRW			2. Comp	pile information of pipes for establishment o 3. Compile customer information	rf GIS into database		
					4. Formulate Standard Operation Proce	dure (SOP) of the above informa	lion management	
			1. Review current situa	tion and develop phased counter meas	sures		4. Formulate manuals on physical loss	S
				2. Conduct trainings of traine	ers/Conduct TOT through implementation o	of NRW/pilot project in North Okk	alapa	1
				3. Prepar	re training plan and training materials by th	e trainers	10. Evaluate cost-benefit of	
	2.3 Develop a model on the management of physical					8Set up DMAs	countermeasures against physical loss of the pilot area	ss
	loss					5. Con	duct Off-JT by the trainers	
Output 2.		6. Select a pilot areas		7. Prepare Ph	nysical loss action plan and equipment	9. Conduct the count	ermeasures against physical loss	1
YCDC on		management			8.Set up DMAs at	the pilot areas	11. Implement 0 JT by the trainers 12. Verify the manuals on physical loss	_
managemen	L. L		1. Review	r current situation and develop phased	counter measures			
				2. Conduct trainings of train	ners/Conduct TOT through implementation	of NRW pilot project in North Ok	(alapa A Eormitata manuale on commercial	lei
				3. Prepar	ire training plan and training materials by th	ie trainers		2
	2.4 Develop a model on the management of commercial					5. Con	duct Off-JT by the trainers	
	loss				6. Prepare Non-phis	ical loss action plan 7.	Conduct the countermeasures against commercial loss	
							8. Evaluate cost-benefit of countermeasures	
						6	Implement O JT by the trainers in the pilot area	)—
							10. Verify the manuals on commercial	ſ
					1. Prepare training p	van for training yard		
	2.5 Develop training yard for NRW management			<u>(</u>	. Design training 3. Prepare equipment an yard	d materials for training yard	6. Conduct Off-JT by the trainers in training yard	
	2					<u>ى</u>	Prepare training manuals and materials for training yard and conduct trainings of the trainers in training yard	
	2.6 Develop and support implementation of the NRW management plans				1. Develop 5-year and 10-year NRV/	management plans 2. L	aunch priority activities as a part of implementing the 5- year NRVV management plan	

## (2) Output 2
		1 2 3 4 5 6	5 7 8 9 10 1	1 12 13 14 15	16 17 18 19 20	21 22 23 24 25 26 2	27 28 29 30 31	32 33 34 35 36 37 38 39 4	0 41 42 43 44 45 46	3 47 48 49 50 51	52 53 54 55 56	57 58 59 60 61 62 63 64 65	66 67 68 69 7	70 71 72
	Year	2015		2016		2017	_	2018	_	2019	_	2020	202	-
	Activity	-	Terr	11	-	-	-	-	-	erm 2	-		-	-
	Wouth	7 8 9 10 11 1 7 Establish	2 1 2 3 4 5	Fection in FO	10 11 12 1 2	3 4 5 3 7 8	9 10 11 12 1	2 3 4 5 6 7 8 9	0 11 12 1 2 3 4	0 4 0 0	10 11 12 1 2	3 4 5 6 7 8 9 10 11	12 1 2 3	4
	3.1 Establish Water Treatment Section	2. Lotabilo	2. Define the d	livision of duties	t of the Water		.e	fold a series of seminar for	basic water treatment	technology with s	study tours			
							+							
	3.2 Review current situation and consider capacity		1. Revi	iew current situ;	ation and conside	sr capacity developm	ent plan							
	development plan													
	0.0 Condition to include of						1. Cond	uct training of trainers on th	e water quality manag	gement				
	trainers on water quality					-	-	2. Prepare the trai	ning plan and training	I manuals by the t	rainers			
	management									3. Conduct	Off-JT by the trait	ners		
	3.4 Develop SOP for water					_		1. Develop	SOP on water quality t	test and monitorir	J BL			
	quality management					-	3.0	evelop SOP on operation ar	Id maintenance of wat	ter treatment plan	It & disinfection fa	acility		
Output 3. Capacity of				1. Procure v	vater quality analy	lysis and water quality	f management ec	quipment						
YCDC on water quality						-	2. Conduct	: OJT on water quality test a	nd monitoring					
managemen is improved	t 3.5 Conduct O.IT on water				3. Dį	agnose function of tre	atment processe	S				]		
	quality management at the						4. Devi	elop improvement measures	of function of Nyaung	ghnapin WTP thro	ough pilot basin			
	disinfection facilities						-	5. Prepare an imp	rovement plan of Nyau	unghnapin WTP	-			
							6. Condu	ct OJT on operation and ma	intenance of water tre	eatment plant & di	isinfection facility			
							-		7. Verify SOP for	water quality mai	nagement			
	3.6 Conduct OJT on					Review water quality	problems in rest	ervoir water						
	improvement of water quality supplied from reservoirs			J				2. Research wat	er quality improvemen	nt measure of res	ervoir suppled wa	tter		
									motion E voor and 40.	store meters accelte	meneocom i			
	3.7 Develop and support							-	evelop o-year ariu ru-	-year water quality				
	quality management plans										2. Launch priority wat	activities as a part of implemer ter quality management plan	nting 5-year	
	Year	2015		2016		2017		2018		2019		2020	202	-
Activity	Month	7 8 9 10 11 12	2 1 2 3 4 5	6 7 8 9	10 11 12 1 2	3 4 5 6 7 8	9 10 11 12 1	2 3 4 5 6 7 8 9 1	0 11 12 1 2 3 4	6m2 58789	10 11 12 1 2	3 4 5 8 7 8 9 10 11	12 1 2 3	4 0 0
[1] Deve workplan	Hopment and discussion for monitoring sheet (MS)	▲ Warkplan	MS Ver.1	-	MS Ver.2		MS Ver.3	MS Ver.4 MS Ve	n:5 MS Ver.6	Ø	▲ MS Ver.7	MS Ver.8	A MS Ver.9 MS	▲ S Ver.10
[2.1]Base	eline survey ine survey	Baseline survey	y 1			Baseline survey 2		Vorkplan (Term 2)			Endline	0.5	Endline	[0]
E Trainii training co	ng in Japan / Third countries vurse				Thailand Combodi		Cembodia Tokyo	Combodia						
e [5]Procui	rement of equipment													
E [6.1]Proc	treport				E.	21		PR2	PR3			PR4	Progress	Final
Z [7]Inform	ation collection about related ply project													;
	tical monitoring dination committee (JCC)		-	ĩ	<b>a</b>		<b>1</b> 4	S	∎6		Terminal			
JICA n	nonitoring mission										Eve			
[10]Semi	norr/S)/Workshop(W)		MJJC		MUUC		Governage Seminar	JCI			JC4-1 JC4-2			
				L. L						Salah halah halan				

### (3) Output 3 and Common Activities

資料-3: セミナー・研修の実施実績

## 3. Records of Seminars and Trainings

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I.	List of Seminars	
II.	List of Trainings	
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IV.	List of training course in foreign countries	
V.	Presentation materials presented by C/P in foreign seminars/conference	

### I. List of Seminars

No	Date	Contents	Particip
Outr	ut 1-3 Custom	ler Service	
<u> </u>	Customer Service N	Anagement	
1.	03/07/2017	Customer Service Management, case in Tokyo	9
2.	06/12/2018	Head Office Duties in billing, collection and customer services	50
3.	07/12/2018	Making work-manuals	47
4.	04/03/2019	Creating procedure of water charge collection work manual	11
5.	07/03/2019	The survey method of T / S work related to water charge collection work manual creation	11
6.	04/06/2019	Procedure for creating work manual and SOP	7
7.	05/06/2019	Specific examples of meter reading work manual	7
8.	11/06/2019	Specific examples of unpaid charges collection manual	7
9.	29-30/10/ 2019	Tokyo Metropolitan Bureau of Waterworks Collection Operation Manual	11
10.	31/10/2019	Procedure for transition to bimonthly meter reading	10
11.	23/1/2020	About the role of the meter reading route code	7
12.	29/1/2020	Creating a manual for the customer service department	7
13.	15/9/2020	Overview of Customer Service Management Section Future Vision (Draft)	5
14.	8/12/2020	Toward the examination of the water supply smart meter introduction policy	5
15.	28/12/2020	Examining policies for diversifying payment methods	5
16.	28/1/2020	Monthly work report and setting of support target numerical values	55
I	Billing & collection	system	
17.	15/12/2017	RFP for new billing & collection system	11
I	Promotion of comp	uterization	
18.	07/03/2018	How to computerize YAPA-forms	12
19.	22/06/2018	Utilization of excel tools for meter reading management and bill collection	15
0.4	4 1 4 M	management	
Outp	ut 1-4 Monitor		1
20.	23/12/2019	Seminar on Data Entry for PIs datasneet for all 1/S offices	
	out 1-5 Kegulat	lion	
21		Laws and Doculation System Water Supply in Japan	17
21.	05/00/2018	Laws and Regulation System     - water Supply in Japan       Water Tariff Billing and Collection in VCDC Regulation	17
22.	07/09/2018	Water Service Connection in VCDC Regulation	8
23.	12/12/2018	VCDC Water Supply Regulation (Comment for 1st Draft)	15
Outr	12/12/2018	al Management	15
Outp	Series of seminar: S	Sustainable management and organization in water supply	
25	17/08/2015	Why independent and self-sufficient	32
20.	24/08/2015	How independent and self-sufficient in other	54
26.		water utilities	
27	31/08/2015	How water supply in Yangon city be	57
27.		independent and self-sufficient	
5	Series of Lectures "	What is Capital Expenditure"	
28.	02/10/2017	Capital Expenditure at Budget, P/L and B/S	15
29.	03/10/2017	Capital Expenditure in Water Tariff Setting	15
30.	13/10/2017	Capital Expenditure and Financial Plan	15

31.       19/10/2017       Capital Expenditure and Profit and Cost of service       15         32.       06/03/2018       How to make Guidelines for Fixed Asset Accounting in EDWS       10         33.       07/03/2018       How to make Guidelines for Nater Tariff Setting in EDWS       10         34.       27/08/2018       Fixed Asset Management       18         34.       27/08/2018       Fixed Asset Management in EDWS -How to set categories and useful life       18         35.       200/2016       PIP       18         36.       200/2016       PIP       18         37.       26/06/2018       Private Sector Involvement (PPP, Outsourcing, etc.)       23         38.       13/09/2010       Fixpert Serpective on the PPP project       33         39.       16/08/2016       Tariff Setting       11         41.       19/08/2016       Tariff Setting       11         42.       19/08/2016       Tariff Setting       11         43.       19/06/2016       Tariff Setting       11         44.       19/08/2016       Tariff Setting       11         44.       19/08/2016       Tariff Setting       40         50.       11/2015       Regulation for water supply utilitics       58	No	Date	Contents	Particip ants
Series of Lectures "Workshop for making Guidelines"32.06/32/0218How to make Guidelines for Water Tariff Setting in EDWS10Fixed Asset Management10Fixed Asset Management18PPP1334.27/08/2016PPP1335.30/08/2016PPP1336.209/2016PPP1337.26/06/2016PPP1338.13/09/2016Private Sector Involvement (PPP, Outsourcing, etc.)2338.13/09/2016Tariff Setting1040.16/08/2016Tariff Setting1041.19/08/2016Tariff Setting1042.08/03/2016Tariff Setting1143.19/06/2019Discuss new Water Tariff (Task-Force kick-off meeting)1243.19/06/2019Discuss new Water Tariff (Task-Force kick-off meeting)11Water Utility Management and Organization5844.20/88/2016How to cope frame/a Water Surply utilities4545.30/11/2015Characteristics of Water Supply utilities4547.14/12/2016How to cope financial difficulties in near future5248.12/08/2016How to cope financial difficulties in near future5249.20/12/2016Rest management and accounting for vater supply utilities4549.12/12/2016Asst traiff4040.12/208/2016How to cope financial difficulties in near future5249.20/12/2016 <th>31.</th> <th>19/10/2017</th> <th>Capital Expenditure and Profit and Cost of service</th> <th>15</th>	31.	19/10/2017	Capital Expenditure and Profit and Cost of service	15
32.     00/03/2018     How to make Guidelines for Yaref Asset Accounting in EDWS     10       Fired Asset Management     10       Attract Asset Management     10       Fired Asset Management     11       Attract Asset Management     11       Fired Asset Management     11       Total Asset Management     12       Attract Asset Management in IDWS - How to set categories and useful life     18       PP       Total Asset Management (PPP Outsourcing, etc.)     23       Attract Asset Management in IDWS - How to set categories and useful life       7       Asset Tariff Setting       10       Asset Tariff Setting       10       Asset Tariff Tariff Setting Fire       Asset Tariff Tariff Setting	5	Series of Lectures "	Workshop for making Guidelines"	
33.         10/03/2018         How to make Guidelines for Water Tariff Setting in EDWS         10           34.         12708/2018         Fixed Asset Management         18           35.         3008/2016         PPP         13           36.         209/2016         PPP         13           37.         2506/2016         Partif Setting         23           38.         1309/2016         Fartif Setting         10           41.         1908/2016         Tartif Setting         10           42.         0863/2019         How to set Water Tartif Tartif Setting         10           41.         1908/2016         Tartif Setting         11           42.         0863/2019         How to set Water Tartif Tartif Tartif Setting         12           43.         1906/2019         Discuss new Water Tartif Tartif Setting         13           43.         1906/2019         Discuss new Water Tartif Tartif Setting         40           45.         3011/2015         Characteristics of water supply utilities         58           46.         81/2015         Regulation for water supply utilities         45           47.         14/12/2016         How accounting for water supply utilities         45           47.         14/12/20	32.	06/03/2018	How to make Guidelines for Fixed Asset Accounting in EDWS	10
18.         27/08/2018         Fixed Asset Management in EDWS -How to set categories and useful life         18           19.         7         18         18           209/2016         PPP         13           36.         209/2018         Private Sector Involvement (PPP, Outsourcing, etc.)         23           37.         2506/2018         Private Sector Involvement (PPP, Outsourcing, etc.)         23           38.         13.09/2019         Expert's Perspective on the PPP project         35           30.         1608/2016         Tariff Setting         10           41.         1908/2016         Tariff Setting         11           42.         08/00/2019         Biosus new Water Tariff         13           43.         19/06/2010         Discuss new Water Tariff         13           44.         29/08/2019         How to prepare for Water Supply utilities         40           45.         30/11/2015         Characteristics of water supply utilities         40           47.         14/12/2015         Asset management and accounting for water supply utilities         45           48.         12/08/2016         How to ope financi difficulties in near future         52           50.         29/02/2019         Review of PR responsibility and check future plan </td <td>33.</td> <td>07/03/2018</td> <td>How to make Guidelines for Water Tariff Setting in EDWS</td> <td>10</td>	33.	07/03/2018	How to make Guidelines for Water Tariff Setting in EDWS	10
34.         L27082.016         FREW Asset Yanagement in EDWS - flow to set categories and useful me         18           35.         30082016         PPP         18           36.         20972016         Privat Sector Involvement (PPP, Outsourcing, etc.)         23           37.         250062018         Private Sector Involvement (PPP, Outsourcing, etc.)         23           38.         13092016         Traiff Setting         10           40.         16082016         Traiff Setting         10           41.         19082016         Traiff Setting         11           42.         98032019         How to set Water Tariff Chak-Force kick-off meeting)         23           44.         29082019         How to set Water Tariff Chak-Force kick-off meeting)         11           45.         30112015         Characteristics of water supply utilities         58           46.         81122015         Regulation for water supply utilities         45           47.         1472015         Regulation on water Supply infit (to 0/50 of Yangon city)         10           51.         20082019         Roscanainable Scheme for Water Supply infit (to 0/50 of Yangon city)         10           52.         07020219         Review of PR responsibility and check future plan         6	24	11xed Asset Manage	ment Eined Asset Management in EDWS. How to get estagonics and weeful life	10
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37.         26/06/2018         Private Sector Involvement (PPP, Outsourcing, etc.)         23           38.         13/09/2019         Expert's Perspective on the PPP project         35           38.         13/09/2019         Expert's Perspective on the PPP project         35           39.         16/08/2016         Tariff Setting         10           40.         16/08/2016         Tariff Setting         10           41.         19/08/2016         Tariff Setting         33           43.         19/06/2019         Discuss new Water Tariff (Task-Force kick-off meeting)         23           44.         29/08/2019         How to set Water Tariff (Task-Force kick-off meeting)         11           Water Utility Management and Organization         Tariff Setting         40           44.         12/08/2015         Regtadiation for water supply utilities         40           45.         30/11/2015         Characteristics of water supply utilities         40           46.         81/22/2015         Rest management and accounting for water supply utilities         45           48.         12/08/2019         Restaring and an one fature         52           50.         20/07/2015         Sustainable Scheme for Water Supply in Yangon (to Chief Minister of YRG)         12           1	36	2/09/2016	ррр	13
38.       1309/2019       Expert's Perspective on the PPP project       35         Water Tariff Setting       10         40.       16/08/2016       Tariff Setting       10         41.       1908/2016       Tariff Setting       10         41.       1908/2016       Tariff Setting       11         42.       08/03/2019       Discuss new Water Tariff (Tark-Force kick-off meeting)       23         43.       1906/2019       Discuss new Water Tariff (Tark-Force kick-off meeting)       23         44.       2908/2019       How to prepare for Water Tariff (Tark-Force kick-off meeting)       23         45.       3011/2015       Characteristics of water supply utilities       46         46.       8/12/2015       Regulation for water supply utilities       40         47.       14/12/2015       Aster making of water ariff       40         50.       28/03/2019       Restrainable Scheme for Water Supply Entity (to /05/or of Yangon city)       10         51.       2007/2019       Restrainable Scheme for Water Supply in Yangon (to Chief Minister of YRG)       12         52.       07/02/2019       Restrainable Scheme for Water Supply in Yangon (to Chief Minister of YRG)       12         52.       07/02/2019       Restrainable Scheme for Water Supply Entity (to /05/or of Y	37.	2.6/06/2018	Private Sector Involvement (PPP, Outsourcing, etc.)	23
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79.	31/08/2017	Hydraulic analysis seminar including utilization and operation of GIS	8
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, ,0.	05/05/2017	$\Delta$ general outline of hydraulic analysis	0
		<ul> <li>How to use software for hydraulic analysis (EPA-net)</li> </ul>	
91.	15/05/2019	Tapping under pressure	22
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92.	21/05/2019	EF joint for HDPE	20
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94.	05,06/09/2019	Completion drawing	6
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		Answer to the Ouestions shown in the Presentation Material of the First Seminar	
		- Presentation by Staff of Water Treatment Plant and Reservoir Section	
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		- Reduction capacity of Coagulation-Sedimentation Treatment for Turbidity	
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00	21/02/2016	- Average Water Flow Velocity in a Sedimentation Basin	17
99.	21/03/2010	Coagulation, Flocculation and Sedimentation process in a beaker (Jar-Test)	1/
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		New Chlorine Generator in Yegu Pumping Station	
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		- Standard Particle Size and Depth of Filter Media	
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104	1/11/2016	Requests and Questions from YCDC Staff through Questionnaire of the Fighth	23

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		seminar	
		- Aluminium Coagulant	
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105.	28/06/2017	Reservoir water improvement (JICA Expert)	11
		≻ What (what parameter) should be improved?	
		> Which reservoir(s) should be the target to improve?	
		➤Could the treatment facility of Gyobyu be useful for intended improvement?	
		What (numerical target) is the goal of the improvement?	
		To make improvement research plan	
		Schedule	
		Contents of the research	
		To make periodical check regulation for all facilities belong to the reservoir	
		division	
		♦ Basic principles	
		♦ Guideline of the selection of instrument for periodical check	
		♦ Type of check	
		Principles of making and keeping records	
		To make a regulation of long term facility maintenance and renewal plan of	
		WTP and reservoirs.	
		♦ Basic principle of making facility and instrument management ledger at	
		every sites	
		Subscripting and instruments	
		$\Delta$ Basic principle of record making and keeping	
		Basic principle of feedra making and keeping     Drawing of design and document keeping	
		<ul> <li>To make basic principle for making design drawing records</li> </ul>	
		$\Rightarrow$ To make system for keeping and inheriting of design drawings and	
		documents	
		Documents need to be store or made related to the Filter Improvement Activity	
		(JICA Expert)	
		Designs of the pilot filter basins.	
		Completion drawings.	
		▶ Parameter /12/ision and their calculation	
		Filter media and their particle sizes $P_{i}$	
		Depth of the both filter media.	
		Sieve test result of the raw sand	
		Selection of mesh size (opening) of sieves	
		Size and depth of supporting gravel	
		Filter wash condition	
		➢ Backwash rate and surface wash rate	
		➢ Backwash time and surface wash time	
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		▶ Position of the surface wash nozzle (Phase 1 & Phase 2)	
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106	23/08/2017	Activities of TET/EDWS staff)	16
100.	25/08/2017	Total plan of pilot filter basins	10
		What will be remodeled? (Anthracite, Sand, Drainage valve, Wash water rate	
		Ware height of effluent and so on)	
		> Evidences of all remodeling plans	
		Research plan using pilot basins	
		➤Total schedule of the research plan	
		Study and research about sludge removal method (EDWS staff)	
		Research plan	
		$\triangleright$ Result of the research	
		Duties and their schedule of Water Treatment Section (EDWS staff)	
1	1	remonical check regulation	

No	Date	Contents	Particip ants
		➤ Facility maintenance and renewal regulation Drawing of design and document keeping	
107.	03/10/2017	<ul> <li>Technological information about ACH and PAC (EDWS staff)</li> <li>&gt; Jar-Test and Most appropriate dosage (MAD)</li> <li>&gt; Coagulation Efficiency of ACH and PAC</li> <li>&gt; Relation between Raw water turbidity and MAD</li> <li>&gt; Advantage and disadvantage of using ACH and PAC</li> <li>Study and research about sludge removal (EDWS staff, JICA Expert)</li> <li>&gt; Sludge pilling up speed in Phase1&amp; 2 sedimentation basins.</li> <li>&gt; Water flow speed (rate) to scour deposited sludge in a sedimentation basin.</li> <li>&gt; Flocks (Sedimentation speed is used as a parameter of flock size.) intended to be removed in Phase1&amp; 2 sedimentation basins.</li> <li>&gt; Relation between sludge depth/height and water flow speed.</li> <li>&gt; How deep/height of sludge pilling up in Phase1&amp; 2 sedimentation basins is allowed.</li> <li>Reservoir water quality improvement (EDWS staff)</li> </ul>	15
108.	28/11/2017	Progress of the filter improvement TFT (EDWS staff) > Improvement plan of the pilot filters > Basic design parameter > Comparison of the new and old parameter > Drawing of the new pilot filters > Process and procedures of the improvement > Photos of improvement work > Plan of the new pilot filters experiment > Purpose > Monitoring parameter > Schedule Study and research about sludge removal (EDWS staff) > Sum/03/y of the research result > Laying of desludging pipes > Future plan of desludging research Reservoir water quality improvement (EDWS staff) > Plan of a pilot plant. > Water quality of Gyo byu reservoir in the past. Schedule	16
109.	23/01/2018	<ul> <li>Progress of the filter improvement TFT (EDWS staff)</li> <li>&gt; Progress of the improvement of the pilot filters</li> <li>&gt; All the process should be recorded</li> <li>&gt; All the process should be checked</li> <li>&gt; Making filter sand, laying down filter materials, rise of weir, wash water drainage valve, surface wash pipe, size of filter sand and anthracite and etc.</li> <li>&gt; Drawing of the new pilot filters</li> <li>&gt; Plan of the new pilot filters experiment</li> <li>&gt; Purpose</li> <li>&gt; Monitoring parameter</li> <li>&gt; Water level in the filter</li> <li>&gt; Firequency of backwash</li> <li>&gt; Filtrate water quality</li> <li>&gt; Schedule</li> <li>Reservoir water quality improvement (EDWS staff)</li> <li>&gt; Final plan of a pilot plant.</li> </ul>	14
110.	16/03/2018	<ul> <li>Rapid Filter Improvement TFT; Pilot basin of Phase 2.</li> <li>Repair of water leak from pressure chamber wall at the point of backwash water pipe connection.</li> <li>Set a countermeasure not to be involved air in backwash water. Or a countermeasure to remove air before backwash.</li> <li>Procedure of the filter washing.</li> <li>How many backwash pumps you will use after leak repair.</li> <li>Procedure to set appropriate surface wash rate (10~20cm/min), opening degree of the valve.</li> <li>Procedure to set appropriate backwash rate (40~45cm/min), opening degree of the valve, a countermeasure not to open the valve excessively.</li> <li>Research plan</li> </ul>	4

No	Date	Contents	Particip ants
		• Purpose.	
		• Monitoring parameter.	
		<ul> <li>Water level in the filter</li> <li>Frequency of backwash</li> </ul>	
		<ul> <li>Filtrate water quality</li> </ul>	
		• Schedule.	
		Rapid Filter Improvement TFT; Pilot basin of Phase 1	
		$\triangleright$ Production of the filter sand of which specification is as same as the Phase 1	
		pilot basin.	
		Repair and replacement of false floor and strainer.	
		➢ Replacement of wash water drainage.	
		Schedule of the improvement of Phase 1 pilot filter basin.	
		Sludge management in Nyaunghnapin WTP	
		Long term cleaning plan and schedule	
		• Schedule procedure	
		$\diamond$ Phase 2	
		• Plan, procedure,	
		Research plan of No. 1 basin of Phase 1.	
111.	22/05/2018	Meeting about chlorination & disinfection (JICA Expert)	8
		Introduction of Chlorine Disinfection Facility.	
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		Basic plan of chlorination (disinfection) of EDWS.	
		$\gg$ Sum/03/y and object of chlorination facility.	
		Details of chiormation facility Necessary information and plan for using sodium hypochlority	
		Water quality control of chlorination (disinfection)	
		$\Rightarrow$ To make daily check of residual chlorine concentration at all facilities.	
		♦ Monitoring of residual concentration and bacteria count in the	
		distribution area.	
		$\diamond$ To clarify a route of water supply and to illustrate it on a map.	
		Prevention and reduction of chlorine consumption in reservoirs and tanks	
		in the distribution area. $\triangle$ Provention and reduction of chloring consumption in vector rings.	
		Requirement of Disinfection and Water Quality Test in Drinking Water Supply	
		Svstem	
112.	27/08/2018	Things necessary for the Chlorination WG Discussion and Activity (JICA Expert)	16
		Introduction Schedule of the Chlorination (Disinfection) Facility	
		<ul> <li>Details of chlorination facility</li> </ul>	
		$\diamond$ To prepare necessary plans for O&M of facilities and water quality	
		control	
		To clarify a route of water supply and to illustrate it on a map.	
		<ul> <li>Basic plan of chlorination (disinfection) of EDWS</li> </ul>	
		<ul> <li>Control method of Chlorine dosing</li> </ul>	
		> Water quality management of chlorination (disinfection).	
		> To prevent reduction of chlorine concentration	
		To clean the inside of pipes	
		➢ To eliminate area where water/05/stagnate.	
113.	27/08/2018	Agenda for Nyaunghnapin WTP: Rapid Filter Improvement TFT and Procedure	16
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		Pilot basin of Phase 2	
		Performance result	
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		(water age) of water in the distribution area.	
114	17/10/2018	Chlorine dosing house (JICA Expert)	16
		>Chlorine Dosing House	
		➢Plain Drawing of Chlorine Dosing Facility	
		Dosing Room and Dosing pumps	
		Example of dike in dosing house	
		Basic policy of chlorination in Japan (JICA Expert)	

No	Date	Contents	Particip ants
		➢Basic policy of chlorination in Japan.	
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		♦ Water Supply Act of Japan	Í
		Enforcement Regulations of the Water Supply Act	Í
		<ul> <li>Drinking Water Quality Standards in Japan</li> <li>MHI W. Ordnance of Water Supply Facility Standards based on the Water</li> </ul>	Í
		Supply Act	ĺ
		<ul> <li>Notice of the director of the Water Supply Division, Health Service Bureau, MHLW (No. &amp; place of sampling points for water quality test)</li> </ul>	
115.	17/10/2018	Relation between Amount of Water Supply, Amount of Raw Water Intake and WTP	16
		Capacity (JICA Expert)	Í
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		Basic Parameter of Filter	ĺ
116.	13/12/2018	Selection of water treatment process (JICA Expert)	17
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		Evaluating Process Options at Expansion or New Water Source of WTP	Í
		Examples of Treatment Process Selection	Í
	FFT Seminar	Available water Quality information	
117.	27/08/2016	Basic Design Parameters and Design Standard	18
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		Rapid Sand Filtration	ĺ
		- Structure of filter	ĺ
		- Filtration velocity and it's control	Í
		- Filter media	Í
		- Underdrain system	
118.	2, 6/09/2016	How to get yield, minimum and maximum diameter of a filter media from a sieve	8
110	26/10/2016	analysis	14
119.	26/10/2016	Review of the last IFI mini seminar	14
		Requirements to be considered in the filter improvement plan	ĺ
		- Wash water drainage valve	Í
		- Particle size of filter media	Í
		- Quality test methods of anthracite	Í
		- Inickness of filter media layers - Filter wash (Backwash) condition	Í
		- Countermeasures to prevent filter sand outflow	ĺ
		- Repair and improvement of filters	
Outp	ut 3 Water Qu	ality Analysis	
120.	1/02/2016	Schedule of seminar	19
		Concept of Monitoring plan development	Í
		- Purpose of monitoring plan	Í
		- Monitoring plan development	Í
		Case Example of Monitoring Plan in Japan (Osaka City and Fukuoka City):	ĺ
101	10/02/2016	Review of existing monitoring plan of YCDC	10
121.	10/02/2016	Proposal of New Water Quality Monitoring Plan by Expert	19
		- Sampling point of Valer works lacing	Í
		- Water quality monitoring item	Í
122.	3rd 25/05/2016	Safety Handling of Sodium Hypochlorite	35
		- Characteristics	Í
		- Effect to Human	Í
		- Maintenance of Facilities	Í
		- Safety Facilities	Í
<u> </u>		- Emergency Response	
123.	9/06/2016	Validation of Analysis Method	11
		Example of DPD Residual Chlorine Analysis Method Based on the experimental result of VCDC laboratory	
		- Accuracy and Precision	
		- Quality control of water quality monitoring	

No	Date	Contents	Particip ants
		- Validation of DPD method	
124.	10/06/2016	□ □ Practical training: Statistic calculation of water quality monitoring data	11
125	25/10/2016	Case study using Kokkowa water quality data	20
125.	25/10/2016	- Background of small laboratory	20
		- Equipment	
		- Roll of small laboratory staff	
		- Schedule of small laboratory installation	
126.	27/12/2016	Operation training of small laboratory equipment	21
		- Introduction of small laboratory equipment	
		- Operation training of small laboratory equipment (Trainee: YCDC Central Lab.	
		staff)	
127.	28/12/2016	Operation training of SS measurement	11
128.	15/02/2017	Water quality monitoring item	11
		- Kind of pollution source	
120	12/10/2017	- Kelationship among monitoring items	21
12).	12/10/2017	► Introduction of new chlorination facility	21
		► Location and specification of new chlorination facility	
		➢ Planned chlorinated water service area	
		Roll of chlorination facility	
		$\sim$ Handling of sodium hypochlorite Preparation of $\Omega \& M$ system of chlorination facility	
130.	04/12/2017	WO monitoring item (Training for small laboratory staff)	20
1000	0.012/2017	Monitoring equipment in small laboratory	20
		➢ Importance of calibration	
		Water quality monitoring item in small laboratory	
		SOPs of small laboratory	
		Water quality data analysis	
131.	29/03/2018	Review small laboratory data	20
		➢ Water quality data analysis tool	
		♦ Long term WQ change	
		♦ Correlation between differing WQ item	
		$\gamma$ Calculation of rejection ratio	
		♦ Review Gvobvu, Phugvi, Hlawga and Yegu data	
		Review WQ change from upstream	
132.	20/7/2018	Introduction QA / QC system	11
		Introduction ISO and GLP system	
		Key component of GLP	
		➢ Introduce GLP to EDWS	
		lest method of internal quality control	
		<ul> <li>Calculate and assessment</li> </ul>	
		Introduction Accuracy control chart and Precision control chart	
133.	24/7/2018	Training about accuracy control chart and precision control chart	11
		<ul> <li>Preparation of accuracy control chart and precision control chart</li> </ul>	
124	26/7/2018	Data quality assessment using accuracy control chart and precision control chart Training about accuracy control chart and precision control chart (Part2)	11
134.	20/7/2018	<ul> <li>Utilize EXCEL to calculate parameters for accuracy control chart and precision</li> </ul>	11
		control chart	
		Chart drawing and assessment of data quality	
135.	19/1/2019	Simple mathematical tool for data quality management	11
		<ul> <li>Introduction simple mathematical tool</li> <li>Training of calculation</li> </ul>	
		Introduction data quality management structure suitable for EDWS central	
		laboratory	
		Introduction Quality control manual for EDWS central laboratory	
1.6.5		TOC of WQ laboratory Quality Control Manual	
136.	17/09/2019 Sominor for	Introduction QA/QC system: Practical method of Data quality management	9
	Central lab	<ul> <li>CAPA cycle and tool</li> <li>Accuracy check of monitoring equipment</li> </ul>	

No	Date	Contents	Particip ants
		Precision check of measurement data	
		Procedure of Daily accuracy / Precision control	
127	10/00/2010	Practical training using YCDC data	10
137.	19/09/2019	Introduction QA/QC system: Practical method of Data quality management	10
	Seminar for	<ul> <li>Accuracy check of monitoring equipment</li> </ul>	
	mini lab	<ul> <li>Precision check of measurement data</li> </ul>	
	(travel to each	<ul> <li>Procedure of Daily accuracy / Precision control</li> </ul>	
	mini lab., 4	Practical training using YCDC data	
	times)		
138.	29/01/2020	Data quality management (Part2) and Improvement of color measurement	3
		<ul> <li>CAPA cycle and tool (RPD index and Recovery ratio)</li> </ul>	
	Seminar and	<ul> <li>Accuracy check of monitoring equipment (Recovery ratio)</li> </ul>	
	training for	<ul> <li>Precision check of measurement data (RPD index)</li> </ul>	
	mini lab.	Procedure of Daily accuracy / Precision control	
	(liavei lo Nyaunghnanin)	> Improvement of color measurement to eliminate "minus data"	
		(Cleaning of equipment, Zero adjust)	
		Practical training using Mini lab. Equipment and data	
139.	28/02/2020	Data quality management (Part2) and Improvement of color measurement	10
	-04/03/2020	CAPA cycle and tool (RPD index and Recovery ratio)	
	Seminar and	<ul> <li>Accuracy check of monitoring equipment (Recovery ratio)</li> </ul>	
	training for	<ul> <li>Precision check of measurement data (RPD index)</li> </ul>	
	mini lab.	<ul> <li>Procedure of Daily accuracy / Precision control</li> </ul>	
	(travel to Yegu,	> Improvement of color measurement to eliminate "minus data"	
	Hlawga, Phugyi	(Cleaning of equipment, Zero adjust)	
		Practical training using Mini lab. Equipment and data	
Over	all Project		
140	$_{01/00/2017}$	Covernance (Systeinable utility) Seminar	22
140.	13/12/2017	VCDC Governance Seminar	100
141.	Seminars and Works	hons on 55 : Kaizan	100
1/2		5S cominor	80
142.	27 28/10/2016	55 seminar	120
143.	29, 30/05/2017	The 2nd presentation by all offices: 5S application in each office	50
145.	12, 19/06/2017	Workshop to formulate a monitoring check sheet of 5S activities	21
146.	30/08/2017	Presentation by all offices: Utilization of computer	35
147.	11/09/2017	The 3 <sup>rd</sup> Seminar: 5S patrol and method to identify key issues	110
148.	19/01/2018	The 4 <sup>th</sup> seminar: Formulation of Kaizen action plan by all offices	120
Ι	Discussions and Sen	ninars with Advisory Committee Members	1
149.	02-06/02/2018	Discussions on Output 2	33
150.	05/02/2018	Discussions on Output 1: PR	9
151.	21, 22/02/2018	Discussions on Output 1: Planning and regulations	20
152.	23/02/2018	Discussions on Output 1: Financial management	8
153.	21, 22/02/2018	Discussions on Output 1: Customer services	12
154.	23/02/2018	Discussions on Output 1: Human resource development	10
155.	22/03/2018	Discussions on Output 3: Water treatment and water quality management	130
156.	23/03/2018	Discussions on Output 3: Water quality monitoring	130

## II. List of Trainings

No.	Date	Target	t Contents	
Outp	out 1-1 New	organization		
Tran	smission and D	istribution Managem	ent	
1.	1/08/2019	Transmission and Distribution Management Team (NRW management Section, Water Supply Section, GIS Section, Pipe Sections, District Office)	<ul> <li>Kick-off meeting for Transmission and Distribution Management</li> <li>Construction of hydraulic model for Transmission system</li> <li>Simulation of the problem areas by the model</li> <li>Identification of improvement measures for flow management by modification of the system and operation</li> <li>Estimation of monthly NRW ratio in the entire system</li> <li>Establishment of Transmission and Distribution Management Section</li> <li>Milestones</li> </ul>	18
2.	07/08/2019	Same as above	Construction of EPANET model.	About 13
	<ul> <li>Establish TDM team</li> <li>Operation team</li> <li>Water demand estimation team</li> <li>Network modeling team</li> <li>NRW estimation team</li> <li>How to construct TD model</li> <li>Procedure of EPANET model</li> <li>Preliminary setting up C-value of pipeline</li> <li>Allocation of water demand (flow) in transmissi system in EAPNET</li> <li>Input operational method (pump and valve)</li> <li>Construction of basic model</li> </ul>			
3.	18/11/2019	(11/2019 Same as above Progress of data collection and model construction		About 10
4.	18/12/2019	Same as above	Understanding monitored flow data Understanding monitored flow data NRW ratio calculation	About 10
5.	5. 02/04/2020 Same as above Utilization of hydraulic model Discharge estimation of Hlawga PS and understanding of pump		Utilization of hydraulic model Discharge estimation of Hlawga PS and understanding of pump curve	15
Outp	out 1-3 Cust	omer Service		
I	Promotion of con	nputerization		
6. 03/12/2018 Customer Service U Sec. Computer Sec. Kyauktada T/S		Customer Service Sec. Computer Sec. Kyauktada T/S office	Utilization of excel tools for meter reading management and bill collection management	15
7.	06/12/2018	PC skills trainer; HRD sec., Computer Sec., etc.	Intermediate Excel skills - Graphs	14
8.	07/12/2018	PC skills trainer; HRD sec., Computer Sec., etc.	Intermediate Excel skills - Functions	13
Outp	out 1-4 Monito	oring		
D	ata input for PIs			
9.	Jul.2016	-	□ Training of data input (Basic of Data input) Using PI data sheet (Jan. to Mar 2016), 1) enhancement of strictness and accuracy of data, 2) homogenization of data (unification of definition, source and calculation) were trained. Appropriate data handling method including unification of definition, source and calculation was trained. Trainee corrected PI existing data sheet reflecting actual performance of YCDC through question and answer with T/S office and related section / department. Then trainee asked T/S office and related section / department to confirm and correct PI data base.	48
10.	related section / department to confirm and correct PI data base.         10.       Sep.2016         -       □ Training of data input (ratio calculation)         Using newly introduced PC, following training was implemented;         1) Improve understanding of the meaning of PI and data input         method, 2) Training of calculation of PI (Calculation of ratio), 3)         Optimization of data sheet using a function of EXCE		155	

No.	Date	Target	Contents	
11.	Dec.2016	-	<ul> <li>Follow-up training (Part1)</li> <li>1) Explain about revised datasheet (T/S office Ver.)</li> </ul>	30
			2) Capacity development of appropriate data collection of T/S office staff	
12.	04/01/2017	-	<ul> <li>Follow-up training (Part2)</li> <li>Reduction of fault of data input work and improvement of quality of</li> </ul>	61
13		T/S office	data base	30
15.	29/04/2017	District office, etc.	PI datasheet, installation of Sub-Format and its preparation method	50
14.	14/09/2017	Planning Sec. C/P	Preparation of Mid-term Management Plan (Preparation of a draft proposal by the relevant sec.)	5
15.	07-21/12/2017 (4 times)	T/S office District office_etc	PI datasheet, Confirmation of data submitted, modification, guidance	24
16.	31/05-06/06 2019	Planning Sec. C/P	<ul> <li>Brainstorming and discussion on "SOP for PIs data collection and monitoring"</li> </ul>	30
			PI data check on FY2016-FY2018 and correction	
17	22/07 25/07/		Guidance to Township officer and other relevant sections	0
17.	2019	Planning Sec. C/P	• PI data check on FY2016-FY2018 and correction on inappropriate data	9
18	26/07-30/07	Planning Sec. C/P	Guidance to Township officer and other relevant sections	8
10.	2019	Training Sec. C/T	• Continuing the brain storming on "SOP for PIs data collection and monitoring"	0
			• Listing up the necessary items for the SOP	
			• Considering the procedure and discussion on the detail contents of the procedure	
19.	2/09-6/09 2019	Planning Sec. C/P	• PI data check on FY2016-FY2018 and correction on inappropriate data	
			• Guidance to Township officer and other relevant sections	
	00/00 10/00/		Optimization of PI data format	
20.	09/09-10/09/ 2019	Planning Sec. C/P	<ul> <li>Finalization of the draft on "SOP for PIs data collection and monitoring"</li> </ul>	6
21.	05/11-22/11/ 2019	Planning Sec. C/P	<ul> <li>PI data check on FY2016-FY2018 and correction on inappropriate data</li> </ul>	42
			• Guidance to Township officer and other relevant sections	
			• PI data analysis on FY2018 for Distribution and NRW sheet, Finance sheet, HRD sheet and understanding the trend	
			• Confirmation and data collection for FY2018/19 in Mid-term Plan and its enhancement	
22.	09/12-20/12/ 2019	Planning Sec. C/P	<ul> <li>PI data check on FY2016-FY2018 and correction on inappropriate data</li> </ul>	40
			• Discussion on countermeasure to prevent inappropriate data entry and planning on Township guidance by each district-base	
			• Training of trainer (young staffs) on PI datasheet and data entry	
			• Confirmation and data collection for FY2018/19 in Mid-term Plan and its enhancement	
23.	09/12-20/12/ 2019	Planning Sec. C/P	<ul> <li>PI data check on FY2016-FY2018 and correction on inappropriate data</li> </ul>	40
			<ul> <li>Discussion on countermeasure to prevent inappropriate data entry and planning on Township guidance by each district-base</li> </ul>	
			• Training of trainer (young staffs) on PI datasheet and data entry	
			• Confirmation and data collection for FY2018/19 in Mid-term Plan and its enhancement	
24.	14/1/2020 – 28/1/2020	Planning Sec. C/P	<ul> <li>Training of trainer (young staffs) on PI datasheet management and data entry</li> </ul>	
	(7 days)		• Confirmation of PIs for FY2018/19 for Mid-term Management Plan	
			• Estimation on the performance value of MKPIs	
1			<ul> <li>Preparation of chart for MKPIs for FY2018/19</li> </ul>	

No.	Date	Target	Contents	
			• Preparation on progress presentation for Advisory Committee visit	
25.	18/5/2020,	Planning Sec. C/P	<ul> <li>Training on the contents of PIs Monitoring manual</li> </ul>	10
	26/5/2020		• Explanation on the manual to the C/Ps	
			<ul> <li>Discussion on the modification points</li> </ul>	
26.	12,26/11/2020 1/12/2020	Planning Sec. C/P	• Consultation and guidance on township performance and its evaluation	15
			<ul> <li>Setting of evaluation indicators</li> </ul>	
			<ul> <li>Evaluation methods with rating</li> </ul>	
Ult	rasonic flow me	ter		
27.	28/6/2019	EDWS HQ	Operation of flowmeter (at Yegu PS)	12
		(Electrical and Pipes	Instructor: Mr. Maeda (lokyo Keiki link.)	
		Yegu PS, Hlawga	kiosk	
		PS, Byaubwesu PS	http://	
		Gyobyu reservoir		
20	12/7/2010	Nyaunghnapin WTP		10
28.	13/7/2019	EDWS HQ	Operation of data logger (at Yegu PS)	18
		Yegu PS. Hlawga	Practical training of data logger system using Vegu	
		PS, Byaubwesu PS	kiosk	
		Gyobyu reservoir,		
		Phugyi reservoir		
20	15/7/2010	Nyaunghnapin WTP	Operation of flow we give motion Dout (at EDWG HO)	(
29.	15/7/2019	EDWS HQ (Computer	Uperation of flow monitoring system, Partl (at EDWS-HQ) Instructor: Mr Toda (Delairco Japan)	6
		Customer service,	Practical training of flow monitoring system operation	
		GIS, Design, and		
		Electrical Sec.)		
30.	23/8/2019	EDWS HQ	Operation of flow monitoring system, Part2 (at EDWS-HQ)	9
		GIS Design and	Distructor: Mr. Toda (Defaired Japan)	
		Electrical Sec.) Yegu	<ul> <li>Report function</li> </ul>	
		PS	>Error report	
31.	30/10/2019	EDWS HQ	Maintenance of flowmeter kiosk (at Yegu PS)	6
		(Electrical Sec.)	Instructor: Mr. Toda (Delairco Japan) and Mr. Maeda (Tokyo Keiki	
		Yegu PS	Ink.) Maintananaa of kiesk	
			<ul> <li>Maintenance of flowmeter RTU nower supply</li> </ul>	
32.	1/11/2019	EDWS HO	Operation of flow monitoring system, Part3 (at EDWS-HO)	11
		(Customer service,	Instructor: Mr. Toda (Delairco Japan)	
		GIS, Design, and	> Operation of flow monitoring system	
		Electrical Sec.)	► Report function	
Out	ut 15 Dogu	regu PS, Hlawga PS	> Error report	
33	29/3/2019	Planning Sec. C/P	Presentation of the draft SOP modification and finalization by the	68
55.	29/9/2019	WG for SOP	relevant sec.	00
34.	5/4/2019	Planning Sec. C/P,	Presentation of the draft SOP, modification and finalization by the	52
		WG for SOP	relevant sec.	
35.	10/5/2019	Planning Sec. C/P,	Presentation of the draft SOP, modification and finalization by the	75
36	24/5/2010	WG for SOP	relevant sec.	66
50.	24/3/2019	WG for SOP	relevant sec.	00
37.	31/5/2019	Planning Sec. C/P,	Presentation of the draft SOP, modification and finalization by the	50
		WG for SOP	relevant sec.	
38.	7/6/2019	Planning Sec. C/P,	Presentation of the draft SOP, modification and finalization by the	30
20	14/6/2010	WG tor SOP	relevant sec.	15
39.	14/0/2019	WG for SOP	resentation of the draft SOP, modification and finalization by the relevant sec	43
40.	21/6/2019	Planning Sec. C/P.	Presentation of the draft SOP, modification and finalization by the	41
		WG for SOP	relevant sec.	
41.	28/6/2019	Planning Sec. C/P,	Presentation of the draft SOP, modification and finalization by the	48
		WG for SOP	relevant sec.	

No.	Date	Target	Contents	
42.	5/7/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	49
43.	12/7/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec	39
44.	26/7/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	46
45.	2/8/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	40
46.	9/8/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	51
47.	16/8/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	46
48.	23/8/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	47
49.	30/8/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	45
50.	6/9/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	37
51.	13/9/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	64
52.	20/9/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	34
53.	27/9/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	27
54.	4/10/2019	019 Planning Sec. C/P, Presentation of the draft SOP, modification and finalization by the relevant sec.		35
55.	18/10/2019	Planning Sec. C/P, WG for SOP	g Sec. C/P, Presentation of the draft SOP, modification and finalization by the relevant sec.	
56.	1/11/2019	Planning Sec. C/P, Presentation of the draft SOP, modification and finalization by the WG for SOP relevant sec		27
57.	15/11/2019	Planning Sec. C/P, WG for SOP	Presentation of the draft SOP, modification and finalization by the relevant sec.	28
58.	12/3/2019	Steering Committee-	Preparation of the draft of Water Supply Regulation of EDWS	24
59.	6/7/2019	Steering Committee 3 (WG – 3.1, SG A&B Meeting)	Preparation of the draft of Water Supply Regulation of EDWS	12
60.	26/8/2019	Steering Committee 3 (SG A&B Meeting)	Preparation of the draft of Water Supply Regulation of EDWS	16
61.	12/9/2019	Steering Committee	Preparation of the draft of Water Supply Regulation of EDWS	17
Outp	out 1-6 Final	ncial Management		
	New C/P memb	er Training		
62.	27/1/2020	New C/P member	Presentation by Eng. (YCDC topics)	10
63.	10/3/2020	New C/P member	Presentation by Eng. (Financial topics)	9
64	$23_{2}/07/2018$	Staff in charge of	Training on how to input the complaint data sheet after receipt of	68
04.	(2  hours)	complaint of District	complaint in each offices	08
Outr	out 1-8 Hum	an Resource Develop	ment Pilot training courses	<u> </u>
	New Staff Train	ing Courses		
65.	1/06/2016 (6 days)	New staff	Outline of water supply business 1	20
66.	20/09/2016 (8 days)	New staff	Outline of water supply business 2	20
67.	6/12/2016 (8.5days)	New staff	Outline of water supply business 3	20
68.	25/01/2017 (2.5 days)	New staff	Outline of water supply business 4	30
69.	7/02/2017 (2.5 days)	New staff	Outline of water supply business 5	30

No.	Date	Target	Contents	
70.	14/03/2017 (7.5 days)	New staff	Outline of water supply business 6	20
71.	22/06- 04/07/2017 (8.5 days)	New staff: engineers	7 <sup>th</sup> New staff training on water supply overview	20
72.	15-17/08/2017 (2.5 days)	New staff: workers	8 <sup>th</sup> : New staff training on water supply overview	30
73.	10-17/10/2017 (5.5 days)	New staff: clerks	9 <sup>th</sup> : New staff training on water supply overview	20
74.	07-20/12/2017 (8.5 days)	New staff: engineers	10th: New staff training on water supply overview	25
75.	09-11/01/2018 (4 days)	New staff: engineers	11th: New staff training on water supply overview	37
76.	10-12/07/2018 (3 days)	New staff (workers)	<ul> <li>New Staff Training Course 12</li> <li>Overall Concept of EDWS</li> <li>Water Transmission, supply and distribution (Distribution management)</li> <li>Whole Works of T/S Office</li> <li>Safety Working</li> <li>Ngamoeyeik WTP Hlawga Reservoir</li> </ul>	30
77.	15-23/08/2018 (5.5 days)	New staff (clerks)	<ul> <li>New Staff Training Course 13</li> <li>Mission &amp; vision of EDWS and Future Plan</li> <li>Overall concept of YCDC EDWS water utility business cycle</li> <li>Administration and HRD</li> <li>Public Relation</li> <li>Billing &amp; Collection (Site), Customer service</li> <li>GIS</li> <li>Finance</li> <li>production, water treatment</li> <li>water quality</li> <li>Water supply and distribution (Distribution management, El &amp; Mech facilities management)</li> <li>Sanitation</li> </ul>	20
78.	24-27/12/2018 (3 days)	New staff (workers)	<ul> <li>Sanitation</li> <li>New Staff Training Course 14</li> <li>Overall Concept of EDWS</li> <li>Water Transmission, supply and distribution (Distribution management)</li> <li>Whole Works of T/S Office</li> <li>Safety Working</li> </ul>	
79.	08-17/01/2019 (8 days)	New staff (clerks)	<ul> <li>New Staff Training Course 15</li> <li>Mission &amp; vision of EDWS and Future Plan</li> <li>Overall concept of YCDC EDWS water utility business cycle</li> <li>Administration and HRD</li> <li>Public Relation</li> <li>Billing &amp; Collection (Site), Customer service</li> <li>GIS</li> <li>Finance</li> <li>production, water treatment</li> <li>water quality</li> <li>Water supply and distribution (Distribution management, El &amp; Mech facilities management)</li> <li>Sanitation</li> </ul>	30
80.	26-28/05/2019 (3 days)	New staff (workers)	<ul> <li>New Staff Training Course 16</li> <li>Overall Concept of EDWS</li> <li>Water Transmission, supply and distribution (Distribution management)</li> <li>Whole Works of T/S Office</li> <li>Safety Working</li> <li>Lagunbyin WTP, Hlawga Reservoir</li> </ul>	30
81.	9-17/07/2019 (5 days)	New staff (engineers)	New Staff Training Course 17 • Mission & vision, and Future Plan • Overall concept of water utility business cycle • Administration	13

No.	Date	Target	Contents	
			Billing & Collection	
			• Finance	
			Electrical & Mechanical Facilities	
			Water quality     Distribution management	
			• Safety working, 5S+ Kaizen	
			Whole Works of T/S Office	
			Reservoir and water treatment, Lagunbyin WTP, Hlawga Reservoir	
82.	25-27/02/2020	New staff (workers)	New Staff Training Course 18	30
	(3 days)		• Overall Concept of EDWS	
			management)	
			Whole Works of T/S Office	
			Safety Working	
			• Water qiality	
02	11 19/02/2020	N	Lagunbyin WTP, Mayangone T/S office	10
83.	(5.75 days)	New staff (engineers	New Staff Iraining Course 19 Mission & vision and Euture Plan	19
	(3.75 days)	a ciciks)	• Overall concept of water utility business cycle	
			Administration	
			Billing & Collection	
			• Finance	
			Electrical & Mechanical Facilities	
			• water quality	
			• Safety working 5S+ Kaizen	
			• Whole Works of T/S Office	
			Reservoir and water treatment; Gyobyu& Phugyi Reservoir	
	Pre-officer Train	ning Course		
84.	04-14/09/2018	Deputy T/S	Pre-officer Training Course 1	20
	(8.75 days)	Engineers	Mission & vision of EDWS	
			• Overall concept of YCDC EDWS water utility business cycle	
			• Future Plan of FDWS	
			• Admin & Regulation	
			• Finance	
			• HRM & HRD	
			Billing & Collection, Customer Service, PR	
			House Connection	
			Reservoir and production, water treatment	
			• Water Transmission, supply and distribution (Distribution	
			management, El & Mech facilities management)	
			• Safety working	
			• GIS	
			Sanitation	
85.	04-13/12/2018	Deputy T/S	Pre-officer Training Course 2	20
	(7.25 days)	Engineers	Same contents as above.	
86.	04-13/06/2019	Sub-assistant	Pre-officer Training Course 3	18
07	(7.75  days)	Engineers	Same contents as above.	0
87.	(8.0  days)	Sub-assistant	Pre-officer Training Course 4 (online)	9
	T/S Engineers 7	Fraining Course	Same contents as above.	
88.	06-12/11/2018	T/S Engineers	T/S Engineers Training Course 1	20
	(5 days)	e	Mission & vision of EDWS	
			Overall concept of YCDC EDWS water utility business cycle	
			Leadership & Management	
			Future Plan of EDWS     Admin & Regulation	
			Complaint Management PR	
			HRM & HRD	
			Reservoir and production, water treatment	
		1	• Finance	

No.	Date	Target	Contents	Participa
			Water supply and distribution (El & Mech facilities management)	
			Safety Working	
			GIS     Water quality	
			Sanitation	
89.	29/01-	T/S Engineers	T/S Engineers Training Course 2	20
	05/02/2019		Same contents as above.	
	Training course	by duty		
	13-15/03/2018		Basic O&M of tube well pump 1	
90.	(2.75 days) Pump operators · Overall Concept of EDWS		20	
91.	02-04/05/2018	Pump operators in	Base O&M of tube well pump 2	20
	(2.75 days)	T/S	(same as above)	-
92.	06-09/11/2018	Pipe Section,	GIS and pipe mapping	12
	(3 days)	engineers	Outline of GIS     Data input to GPS using GIS	
			<ul> <li>Data input to GPS from Google Earth</li> </ul>	
			Practice: data acquisition at site and input into GPS	
93.	(2.75 days)	Pump operators in	Base O&M of tube well pump 3	20
	Basic PC Skill 7	Training Course	(same as above)	
	23/05-			
94.	15/06/2017 (8 times)	Staff of T/S offices	1 <sup>st</sup> : Basic PC Skill	10
	27/06-			
95.	20/07/2017 (8	Staff of T/S offices	2 <sup>nd</sup> : Basic PC Skill	12
	times)			
96.	07/09/2017 (8	Staff of site offices	3 <sup>rd</sup> : Basic PC Skill	12
ļ	times)			
97.	07-30/11/2017 (8 times)	Staff of head office	4 <sup>th</sup> : Basic PC Skill	12
0.0	06-28/02/2018	Staff af T/S affinan	5th - De-sie DC SI-ill	12
98.	(8 times)	Staff of 1/S offices	5 <sup>th</sup> : Basic PC Skill	12
99.	05/2018	Staff in head office,	Basic PC Skill Training Course 6 Basic operation of Win & Word PowerPoint Excel typing of	12
	x 8times)	site offices	Burmese.	
100.	06/2018	Staff in T/S Offices	Basic PC Skill Training Course 7	12
	(0.5 day		Same contents as above.	
101.	02/2019	Staff in head office,	Basic PC Skill Training Course 8	12
	(0.5 day	site offices	Same contents as above.	
102	x 8times)	Staff in T/S offices	Basic PC Skill Training Course 9	12
102.	(0.5 day		Basic operation of Win 8, Word, PowerPoint, Excel, typing of	12
102	x 8times)		Burmese.	10
103.	10/2019 (0.5 day	site offices	Same contents as above.	12
	x 8times)			
104	Lecture and dril	ll about basic theory of	f waterworks (Yangon Technological University)	1.42
104.	6/01/2017	Young engineers	Hydromechanics (Lecture Part1)	143
105.	15/01/2017	roung engineers	Hydromeenames (Lecture Part2)	108
100.	20/01/2017	Young engineers	Hydromecnanics (Lecture Part3)	00
107.	27/01/2017	Young engineers	Hydromechanics (Lecture Part4)	0U 75
108.	3/02/2017	Young engineers	Water treatment (Lecture Part1)	/5
109.	10/02/2017	Young engineers	Water treatment (Lecture Part2)	69
110.	17/02/2017	Young engineers	Hydromechanics (Drill Part1)	36
111.	24/02/2017	Young engineers	Hydromechanics (Drill Part2)	31
112.	2.     17/03/2017     Young engineers     Demand forecast and distribution (Lecture)		31	

No.	Date	Target	Contents				
Outp	out 1-9 Mid-	term Management P	lan				
113.	14/07/2017	Planning Sec. C/P	Preparation of Mid-term Management plan (Overall schedule and contents)	6			
114.	15/01/2018	Planning Sec. C/P	Training for new staff members of Planning Sec.	3			
115.	02-06/04/2018	Planning Sec. C/P	Population projection, water demand projection and management PIs (MKPIs)	27			
116.	04-15/06/2018	Planning Sec. C/P	Mid-term Management plan – Selection of the Target Activities (Arrangement of activity proposal submitted by the relevant sections, Classification by activity type and mid-term policies, Selection of activities based on mid-term policies, activity type and priority)	36			
117.	14-15/06/2018	Planning Sec. C/P	Mid-term Management plan – Water Demand Projection (Final estimation of water demand, Comparison the demand by M/P with that by MTP)	9			
118.	24/07- 01/08/2018	Planning Sec. C/P	Mid-term Management plan – Selection of the Target Activities (Continuing training No.1, Selection of activities based on Mid- term policies, Activity, Priority)	30			
119.	30-31/07/2018	Planning Sec. C/P	Mid-term Management plan – Water Demand Projection (Water resources projection, Comparison demand with water resource, Preparation of graph)				
120.	07-19/09/2018	Planning Sec. C/P	Mid-term Management plan – Target Setting (Arrangement and analysis of the data in FY2016, Target setting, Coordination with the relevant sections)				
121.	04-14/12/2018	Planning Sec. C/P	Mid-term Management plan – Compilation of MTP (Main, Booklet)	28			
122.	23, 29/01/2019	Finance Sec. C/P	Mid-term Management plan – Review of Financial Projection (Estimation conditions, Operating income and expenditure, Capital expenditure)	7			
123.	17, 30/06/2020	Planning Sec. C/P	Mid-term Management Plan	40			
	8, 27/07/2020		<ul> <li>Comparison of MKPIs data between FY2016 and FY2019</li> </ul>				
	3, 21/ 08/2020		<ul> <li>Confirmation on the results of each MPIs</li> </ul>				
	2, 18/09/2020		- Explanation of the analysis				
0			- Preparation on the Monitoring Report				
Outp	Dut 2 Non-Re	evenue Water Manag	gement				
104	Pipeline design			0			
124.	2/02/2016	-	Usage of equipment of plane-table survey, Drawing of survey map	8			
125.	2/02/2016	-	Weter measure measurement. Installation of formula with	9			
126.	11/02/2016,	-	water pressure measurement, installation of terrule with	2/11:0, 6/1.9			
<u> </u>	1/00/2010		Saddle, Iraining of drifting method of hon-suspension water	2/17.15			
127.	17/03/2016	-	<ul> <li>Planning and designing of pipeline taying</li> <li>Planning and designing of proper pipe diameter</li> <li>Basic of hydraulic calculation (Example of head loss calculation)</li> <li>Calculation of water demand forecast</li> <li>Population forecast</li> </ul>	3/18:16			
			-Forecast of water demand / capita -Hourly factor				
128.	21/03/- 31/03/2016	-	Hydraulic analysis and pipeline designing in pilot area (6 days) Training of designing for DMA construction	3/21:16 3/22:7 3/28:9 3/29:8 3/30:7 3/31:8			
129.	1/04/2016	-	Pipe material (Introduction)	5			
130.	14/12/2016	-	Basic of pipeline designing	25			
131.	16/12/2016	-	Hydraulic analysis and pipeline designing in North Okkalapa and Mayangone TS	24			
132.	01/09/2017	C/Ps of NRW	(1st) Hydraulic analysis practice (case study on North Okkalapa NRW Reduction Project)	6			
133.	08/09/2017	C/Ps of NRW	(2st) Hydraulic analysis practice (case study on North Okkalapa NRW Reduction Project)	6			
134.	06-08/11/2017	C/Ps of NRW	Training for measurement by ultra-sonic flowmeter on site in North Okkalapa T/S	4			
135.	09-10/11/2017	C/Ps of NRW	Pipeline and DMA design practice	4			
	Training about water meter						

No.	Date	Target	Contents	
136.	8/11/-	-	Function check, Usage of test meter	9
	Leakage Measu	Ires	-	
137	29/11/2016	-	Water leakage survey	14
138.	5/12/2016	-	Field training of leakage detector	9
139.	21/11/2017	C/Ps of NRW & Staffs of Research	Water pressure test with local pipe material (PVC, HDPE, plastic saddle)	15
140	08/02/2018	C/Ps of NRW	Measurement of leakage volume	3
141.	04/06/2018	C/Ps of NRW & Shwepyithar T/S	Training for measurement of minimum night flow and night step test in Shwepyithar T/S	22
142.	05/06/2018	GIS Section	Training for GIS-data correction of Shwepyithar field survey	3
143.	07, 11/12/2018 (2days)	C/Ps of NRW	Inspection of pipeline construction site (in Shwepyithar T/S, North Okkalapa T/S, Insen T/S, Lagunbyin site for GREATER YANGON WATER SUPPLY IMPROVEMENT PROJECT))	12
144.	14/02/2019	C/Ps of NRW & Yankin T/S office	Water pressure test in Yankin Pilot project	23
145.	02/2019 -03/2020	C/Ps of pilot project & NRW section	Training for NRW reduction on Yankin pilot project         > Survey by using plane table and Total Station         > Procedure making of SOP         > Water pressure test as an inspection in Yankin Pilot project         > Types of flowmeter         > Flow measurement         > Night Step Test         > Leak survey and repair method         > Proper tapping for service connection         > Meter Box installation         > Proper meter location         > Valve and valve box installation         > Recording (Daily report)         > Customer survey and making list         > Meter function check by test meter         > Jointing and cutting work         \$ DIP         \$ RRVP         \$ HDPE(EF)         > Pressure test         > Meter reading         > NRW calculation	8+14
146.	09/2019 11/2019 – 12/2019	C/Ps of pilot project & NRW section	Training for NRW reduction through training center construction         >SGP piping & threading         >Understanding of water storage tank (Ball tap installation)         >Service pipe installation         >Bulk meter installation         >Pressure test         >Leak detection         >Saddle clamp installation and tapping         >Jointing & cutting work         \$         >IP         \$         >HDPE	8+14
	NRW Manager	nent Training		
147.	21-30/1/2020	SAEs	NRW management training in NRW Training Center >What is waterworks? >Water supply planning >Pipe jointing >Service pipe branch >Leak detection >Outline of NRW >Hydraulic analysis	20
148.	16-30/12/2020	Dy T/S officer	NRW management online training > Water supply planning > Water supply equipment	14

No.	Date	Date Target Contents		Participa nts
			≻Issues caused by water meter	
			≻Meter test kit	
			Monitoring and commercial loss	
			➤Leakage detection	
			➤Minimum night flow and step test	
			Duty and responsibility of Deputy T/S officer	
			► Utilization of NRW management in T/S	
			Laws, Regulation, Guideline	
			NDW advation project	
	GIS training		New reduction project	
149.	8/10/2015	-	Concept of GIS application of EDWS	9
150.	9/03/2016	-	Method of trace of field survey	5
151.	11/03/2016	-	Import of field survey GIS data	9
152.	14/03/2016 - Training of trace of field survey		3	
153.	15/03/2016 - Training of import of pipeline, road and building data (1) 12		12	
154.	16/03/2016	-	Training of import of pipeline, road and building data (1)	12
155.	2/06/2016	-	Import water pressure data to GIS database	7
156.	14/12/2016	12/2016 - Merit of GIS adoption for water supply utility		25
157.	7. 15/12/2016 - Operation of ArcGIS		19	
Outp	out3 O&M of	water treatment plan	, water quality management	
	SOPs training			
158.	5/09/2018	Staff of the WTP	Backwashing the pilot basin in Phase 2 using Backwashing SOP. (Trainer: EDWS $C(\mathbb{R})$ )	7
150	30/01/2019	Staff of Vegu D/S	Explaining about O & M SOPs of No 2 pumping station in Vegu	36
139.	50/01/2019	office	(Trainer: EDWS C/P)	50
160	06/02/2019	Staff of the WTP	Explaining about $\Omega \& M$ SOPs of Nyaunghnanin WTP	16
100.	00/02/2019	office	(Trainer: EDWS C/P.)	10
161.	19/02/19	Staff of Yegu P/S	Explaining about O & M SOPs of SCADA system.	3
		office	(Trainer: EDWS C/P.)	-
162.	21/02/19	Staff of Yegu P/S	Explaining about O & M SOPs of existing chlorine disinfection	6
		office	facility in Yegu. (Trainer: EDWS C/P.)	
	O&M of facilit	ies		
163.	17/12/2019	C/Ps of Hlawga	On the Job Training for Hlawga reservoir chlorination facility	16
		reservoir & the other	>Understanding and inspection the structure of the chlorination	
		chlorination facility	facility	
		staff	>Operation method of the chlorination facility	
			How to make a SOP for the chlorination facility	
164	02/02/2020	$C/D = \theta_{1} = t_{2} \theta_{1}$	Discussion of the contents of the SOP	7
164.	03/02/2020	C/Ps & staff of	On the Job Iraining for Lagundyin WIP	/
		Lagunoyin w I P	Chemical dosing facility     Panid mixing and coogulation facilities	
			<ul> <li>Rapid mixing and coaguiation facilities</li> <li>Sedimentation basins</li> </ul>	
			Rapid sand filters	
			> Operation of the chlorination facility	
1			Theory and calculation of coagulation dosing rate	

No.	Date	Meeting Name	Contents	Team/Section	Presentator
Plar	ining	- <b>-</b>		1	
1	22/12/15	Monthly mtg 5	After 5 years, Expected outcomes our department and necessary Training Plan	Planning Section	N/A
2	09/02/17	Monthly mtg 12	Report of PPWSA training	ACE	ACE U Thet Lwin
3	03/08/15	Weekly W/S 2	Problem Analysis	Planning Team & Finance Team	N/A
4	10/08/15	Weekly W/S 3	Problem & Objective Analysis Report	Planning Team	N/A
5	10/08/15	Weekly W/S 3	Objective Analysis	Planning Section	N/A
6	24/08/15	Weekly W/S 5	Bench/03/king & PI	Expert Team	TA Expert
7	24/08/15	Weekly W/S 5	Existing and Necessary Data	Planning Section	N/A
8	31/08/15	Weekly W/S 6	Planning Functions of Tokyo Metropolitan Government, Bureau of Waterworks (TMWB)	Expert Team	TA Expert
9	05/10/15	Weekly W/S 7	Performance Indicators: Example for Comprehensive PIs	Expert Team	TA Expert
10	19/10/15	Weekly W/S 9	Existing and necessary data record for PIs	Planning Team	N/A
11	19/10/15	Weekly W/S 9	Setting Performance Indicators	NRW Section	N/A
12	26/10/15	Weekly W/S 10	Performance Indicators (PI) (6)	Expert Team	TA Expert
13	14/12/15	Weekly W/S 13	PI format: Data and Performance Indicator	Expert team	N/A
14	07/09/17	JCC 4	Management KPIs	Research section	D. Yamin
15	07/09/17	ICC 4	MTP and Policy	Planning Section	D. Khin San Win
RS(	2M	Jee 1	initiand roney	I fulling Section	D. Rinn Sun Win
16	17/08/15	Weekly W/S /	Necessary Standards & Guideline	Expert Team	N/A
10	17/00/15	Weekly W/5 4	Standarda Guidalina Manual for		
17	05/10/15	Weekly W/S 7	Waterworks in Japan	Expert Team	TA Expert
18	11/07/16	Weekly W/S 22	for Water Supply Facilities of Japan	Expert Team	Ms. Mina and Mr. Ohno
Cus	tomer Ser	vice			
19	26/02/18	JCC 5	Customer service	Customer Service Section	D. Khin Htay Win
20	26/02/18	JCC 5	New customer database	Customer Service Section	D. Aye Aye Mar
21	09/07/19	Half Monthly mtg 17	Duties and Responsibilities	Customer Service Section	D. Win Pa Pa Soe
22	28/08/19	Half Monthly mtg 19	Meter Reading & Collection Work Manual	Customer Service Section	D. Thae Su Hsu Wai
23	01/03/19	JCC 7	Customer Service Management	Customer Service Section	D. Aye Aye Mar
Fina	nce				
24	24/03/16	Monthly mtg 6	Why and How to make Asset Accounting	Finance Section	D. Moe Moe Khine
25	14/06/16	Monthly mtg 7	Asset Accounting	Finance Team	D. Moe Moe Khine
26	10/08/15	Weekly W/S 3	Objective Analysis	Finance Section	N/A
27	17/08/15	Weekly W/S 4	Sustainable management and organization in water supply (1) - Why independent and self-sufficient	Expert Team	Mr. Yoji Matsui
28	24/08/15	Weekly W/S 5	Sustainable management and organization in water supply (2) -How independent and self-sufficient in other water utilities-	Expert Team	Mr.Yoji Matsui
29	31/08/15	Weekly W/S 6	Sustainable management and organization in water supply (3) - How independent and self-sufficient in other water utilities-	Expert Team	Mr. Yoji Matsui
30	30/11/15	Weekly W/S 11	Basics Characteristics of water supply utilities	Expert team	Mr. Yoji Matsui
31	08/12/15	Weekly W/S 12	Regulation for water supply utilities(Basics of water supply utilities (2)	Expert team	Mr. Yoji Matsui
32	14/12/15	Weekly W/S 13	Asset Management and Accounting for water supply utilities (Basics of water supply utilities (3))	Expert Team	Mr. Yoji Matsui
33	21/12/15	Weekly W/S 14	Rate making of Water tariff; Basics of water supply utilities (4)	Expert Team	Mr. Yoji Matsui
34	21/03/16	Weekly W/S 17	Why and How to make asset accounting?	Finance Section	D. Moe Moe Khine

# III. List of Internal Seminars within regular meetings

No.	Date	Meeting Name	Contents	Team/Section	Presentator
35	04/04/16	Weekly W/S 18	Water Supply and Electricity Supply	Finance Section	D. Moe Moe Khine
36	04/04/16	Weekly W/S 18	What Finance Section doing &	Finance Section	D. Moe Moe Khine
37	31/05/16	Weekly W/S 20	How to cope with accumulated Burden of	Expert Team	Mr. Matsui
29	05/00/16	Weekly W/S 26	capital expenditure	Einongo	D. Maa Maa Khina
20	21/10/16	Weekly W/S 20	Terriff Setting Study	Finance Einance Section	D. Moe Wide Killine
39	10/12/16	Weekly W/S 30	Tarini Setting Study	Finance Section	D. May I net Kyaw
40	19/12/16	weekly w/S 30	Training in MWA and PPWSA	Finance Section	D. Moe Moe Knine
41	07/09/17	JCC 4	Fixed Assets Management	Finance Section	D. Moe Moe Khine
42	26/02/18	JCC 5	Objective of Finance Group	Finance Section	D.MayOo Lwin
43	14/12/18	Half Monthly mtg 12	Water Tariff Setting	Finance Section	D. Moe Moe Khine
44	18/06/19	Half Monthly mtg 16	Growing City & Accumulation of Loan	Finance Section	D.MayThet Kyaw
HRI	)				
45	27/08/15	Monthly mtg 2	Process of Capacity Assessment	JICA Expert	Mina Yariuchi
46	07/10/16	Monthly mtg 9	Duties of HRD Sec.	HRD Team	U Kyaw Kyaw Oo
47	03/08/15	Weekly W/S 2	Problem Analysis	HRD Section	N/A
48	10/08/15	Weekly W/S 3	Objective Analysis	HRD section	N/A
49	17/08/15	Weekly W/S 4	Framework of Capacity Development	Expert Team	N/A
50	05/10/15	Weekly W/S 7	Characteristics of HRD in WSD	Expert Team	Ms. Mina Yariuchi
51	08/08/16	Weekly W/S 25	WA turnover and analysis	HRD Section	D. Su Nandar Lin
52	12/09/16	Weekly W/S 27	Concept of HRM and HRD	HRD Section	D. Khin ZinMar Mvint
53	26/12/16	Weekly W/S 32	Training report in MWA	HRD section	D Khin ZinMarMvint
54	00/08/17	Monthly mtg 17	Mini-lecture OIT	HRD section	U Kyaw Kyaw Oo
55	00/08/17	Monthly mtg 17	OIT and proposals to improve	HPD Section	U Kyaw Kyaw Oo
55	07/00/17	ICC 4	Earmulation of HPD Dian	HPD section	U Kyaw Kyaw Oo
50	26/02/18	ICC 5	Ponnet of Japan training	HRD section	D Khin ZinMarMuint
58	08/03/18	Half Monthly mtg	Vision and mission of HRD	HRD Section	N/A
59	23/05/18	Half Monthly mtg	Concept of Self-learning	HRD section	D. Nyo Nyo Tun Kyaw
60	17/05/19	Half Monthly mtg	OJT Instructor workshop	HRD Section	D. Khin ZinMarMyint
61	18/06/19	Half Monthly mtg 16	Training effectiveness to retain staff	HRD Section	N/A
62	01/10/19	Half Monthly mtg 20	Current Situation of HR	HRD section	D. Wine Htet Htet Aung
63	21/10/19	JCC 8	Overview of HRD Plan	HRD Section	D. Khin ZinMarMyint
64	21/10/19	JCC 8	HRD for Productivity Improvement	JICA TA Team	Ms. Mina Yariuchi
65	21/10/19	JCC 8	Review of HRD discussion	EDWS	D. Thwe Naing Oo
PR					
66	23/05/16	Weekly W/S 19	Future plan of PR, EDWS	Expert Team	Ms. Yamada
67	31/05/16	Weekly W/S 20	Future plan of Customer Service, EDWS	Expert Team	Ms. Yamada
68	02/08/16	Weekly W/S 24	Websites and School activities	Expert Team	Ms. Yamada
69	07/09/17	JCC 4	Development of materials for awareness raising activities	Public Relation Team	D. OhnMar
70	26/02/18	JCC 5	PR activity	Public Relation Team	U Htay Naing
71	17/12/19	Half Monthly mtg	Chlorine Dosage awareness	PR section	D OhMar Aung
NP	V manage	22 ment			
72	03/08/15	Weekly W/S 2	Causes & Effects of Problems/Issues	NRW Section	N/A
72	03/08/15	Weekly W/S 2	Problem Analysis	NRW Section	N/A
71	10/08/15	Weekly W/S 2	Objective Analysis	NRW Section	N/A
75	21/05/12	Weekly W/S 3	Lecture for Ding Size Calculation	NDW Section	N/A
74	<u>31/03/10</u> 11/07/16	Wookly W/S 20	Droparation of Flow Mater In tell	NDW Management	IV/A
10	11/0//10	WEEKIY W/S 22	NDW Countorman of T	int w management	
77	28/01/16	JCC 1	Waterworks	JICA AC	Mr. Koji Nakanuma
78	26/12/16	Weekly W/S 32	GIS outline & Utilization in EDWS	GIS Section	N/A
79	07/09/17	JCC 4	Progress of NRW Management Activities	NRW Section	U Aung Min Oo
80	26/02/18	JCC 5	Progress of NRW Management Activities	NRW Section	D. Yu Yu Hla Baw U Aung Min Oo

No.	Date	Meeting Name	Contents	Team/Section	Presentator
81	26/02/18	JCC 5	PPWSA Improvement Plan	NRW Section and Customer Service Section	D. Yu Yu Hla Baw & D. Aye Aye Mar
82	23/05/18	Half Monthly mtg 7	Meter Function Test and Measuring the Leakage Volume	NRW section	D. Yu Yu Hla Baw
83	07/06/18	Half Monthly mtg 8	Minimum night flow test	NRW section	D. Win Maw
84	09/07/18	Half Monthly mtg 9	NRW Analysis in Shwe Pyi Thar	NRW Section	U Kaung Zaw Htet
85	24/08/18	Half Monthly mtg 10	Compile & Check the service coverage data	NRW Section	N/A
Wat	er Quality	y Management &	Monitoring		
86	15/10/15	Monthly mtg 3	Microbiological Test Results for Kyauktada Tsh	WQ Monitoring and Management	N/A
87	24/03/16	Monthly mtg 6	Seminar of Water Quality Monitoring	WQ Section (Laboratory)	D. Hsu Myat Mon
88	13/12/16	Monthly mtg 11	Residual Chlorine Monitoring	WQ Section	D. Hsu Myat Mon
89	03/08/15	Weekly W/S 2	Problem Analysis	WQ Management	N/A
90	03/08/15	Weekly W/S 2	Problem Analysis	Water Treatment Section	N/A
91	10/08/15	Weekly W/S 3	Objective Analysis	WQ Management Section	N/A
92	10/08/15	Weekly W/S 3	Objective Analysis	Water Treatment Section	N/A
93	24/08/15	Weekly W/S 5	PIs for Output 3	Planning Section	N/A
94	08/12/15	Weekly W/S 12	Water Environment Monitoring Training Report	WQ Monitoring Section	D. Zin Zin Thu
		Water Treatment		Water Treatment &	U Zaw Oo, U Nyi Nyi
95	23/12/15	Technology Seminar	Water Treatment Technology	Quality	Aung, D. Ei Khine Mon
96	23/05/16	Weekly W/S 19	CHLORINE FACILITIES AND DISINFECTION	WQ	Nyein Htet
97	31/05/16	Weekly W/S 20	WTP Management using water quality data	WQ Management Section	N/A
98	04/07/16	Weekly W/S 21	Brief Explanation of water Quality monitoring	WQ Monitoring Section	D. NweNwe Zin
99	04/07/16	Weekly W/S 21	Progress of Activities Nyaungnapin WTP	WQ Management	D.MayThawdar Oo
100	05/09/16	Weekly W/S 26	Operation And Maintenance Of Urban Water Supply System and Loss of Books & Utilization	WQ Section	D. Ei Khine Mon
101	12/09/16	Weekly W/S 27	Operation And Maintenance Of Urban Water Supply System	WQ Section	D. Ei Khine Mon
102	31/10/16	Weekly W/S 29	Water Quality Report of NNP WTP	WQ Section	D. ThidarSu Su Khin
103	31/10/16	Weekly W/S 29	Action Plan of training course	WQ	D. Ei Khine Mon
104	28/01/16	JCC 1	Transition of WQ Control and Water Purification Process & Importance of O&M	ЛСА АС	Mr. Noriyuki Hayashi
105	28/01/16	JCC 1	Water Safety Plan (Decision & apply)	JICA AC	Mr. Yoshinobu Kiuchi
106	28/01/16	JCC 1	Current Issues and Expected Future vision on WQ Monitoring & Management of Yangon City Water Supply System	WQ Lab	D.MayZin Oo
107	28/01/16	JCC 1	Capacity development of Water Quality Management	JICA Expert Team	Mr. Morita
108	30/01/17	JCC 3	Review of 1st JCC Transition of Water Quality Monitoring and Treatment in JAPAN and FUKUOKA City according to development of Water supply service (FCWB)	WQ Section	N/A (Fukuoka city?)
109	05/06/17	Monthly mtg 14	Activities of improvements in 2016	WQ Section	D. Ei Khine Mon
110	05/06/17	Monthly mtg 14	Mini laboratories and measuring parameters	WQ Section	D. Ei Khine Mon
111	27/07/17	Monthly mtg 16	Laboratories Inspection	WQ	D. Ei Khine Mon
112	09/08/17	Monthly mtg 17	Removing sludge in WTP	Water Treatment Section	U Thit Lwin

No.	Date	Meeting Name	Contents	Team/Section	Presentator
113	26/05/17	Monthly mtg 14	Baseline report	WQ Monitoring Section	D. Ei Khine Mon
114	26/05/17	Monthly mtg 14	Mini laboratories and measuring parameters	WQ Monitoring Section	D. Ei Khaing Mon
115	27/07/17	Monthly mtg 16	Laboratories Inspection	WQ Management Section	D. Ei Khine Mon
116	28/09/17	Half Monthlly Meeting 2	Residual chlorine monitoring results	WQ Monitoring Section	D. Ei Khine Mon
117	28/09/17	Half Monthlly Meeting 2	Report of training in Japan	WQ Monitoring Section	D. NweNwe Zin
118	07/09/17	JCC 4	Setting and Purpose of TFT	Task Force Team	U Zaw Oo
119	07/09/17	JCC 4	Analytical methods calibration within internal staffs	WQ Monitoring Section	D. Thandar Myat
120	07/09/17	JCC 4	O&M Manuals for Facilities in WTP (Cambodia)	Water Treatment Section	U Zaw Win Aung
121	07/09/17	JCC 4	Gyophu Improvement	Reservoir Division	U Zin Min Latt
122	07/09/17	JCC 4	Sludge Removing	WTP	U Thit Lwin
123	26/02/18	JCC 5	Activities of NNP Water Treatment Plant improvement	Water Treatment Section	U Zaw Oo
124	26/02/18	JCC 5	Results of experiment of direct filtration	WTP	U Zin Min Latt
	20/02/10	Half Monthly mtg	Lecture about measuring water		
125	06/12/17	4 Half Monthly mtg	parameters	WQ Section	D. Ei Khaing Mon
126	16/01/18	5 Half Monthly mtg	On-site Residual Chlorine Monitoring	Section	D. Ei Khaing Mon
127	16/01/18	5 Ualf Monthly mtg	Preparation of Chlorination in YCDC	N/A	N/A
128	08/03/18	6	Report of Training in PPWSA	WQ Section	D. Ei Khine Mon
129	08/03/18	Half Monthly mtg 6	Report of Training in PPWSA	Section	U Zaw Win Aung
130	23/05/18	Half Monthly mtg 7	ACH Jartest of Nyaungnapin WTP	Water Treatment Section	D.MayThawdar Oo
131	23/05/18	Half Monthly mtg 7	WTP Plan for Sludge Management	Water Treatment Section	U Thit Lwin
132	23/05/18	Half Monthly mtg 7	Review Small lab data	WQ Section	D. Thandar Myat
133	09/07/18	Half Monthly mtg 9	Report of training in Japan	WQ Section	D. Thandar Myat
134	24/08/18	Half Monthly mtg 10	WTP Phase one sludge level	Water Treatment Section	U Thit Lwin
135	24/08/18	Half Monthly mtg 10	QA/QC system	WQ Section	D. NweNwe Zin
136	24/08/18	Half Monthly mtg 10	Procedure of developing SOPs	Water Treatment Section	U Zaw Win Aung
137	11/10/18	JCC 6	Enhance Laboratory Capacity	WQ monitoring Section	D. Ei Khine Mon
138	11/10/18	JCC 6	Framework for Developing SOPs	Water Treatment Section	U Zaw Win Aung
139	18/01/19	Half Monthly mtg 13	Condition of Mini-Labs	WQ Section	D. Thandar Myat
140	20/02/19	Half Monthly mtg 14	SOP Framework and regulations	Water Treatment Section	U Zaw Win Aung
141	18/06/19	Half Monthly mtg 16	Capacity enhancement of Mini laboratory through improvement of PDCA cycle	WQ Section	D. Hsu Myat Mon
142	06/08/19	Half Monthly mtg	Report of training in Japan	WQ Monitoring Section	D. New New Zin
143	28/08/19	Half Monthly mtg 19	Full scale application of SOPs	Yegu P/S	D. Tinzar Lwin
144	17/12/19	Half Monthly mtg 22	Water Treatment TFT Final Report	Water Treatment Section	U Zaw Oo
Trai	nsmission	and distribution N	Management		
	00/10/1		Design of distribution flow management		
145	03/12/15	Monthly mtg 4	system(Flow meter installation)	JICA Advisor Office	Mr. Watanabe

No.	Date	Meeting Name	Contents	Team/Section	Presentator			
146	18/06/19	Half Monthly mtg	Transmission and Distribution	IICA Expart	Mr Koga			
110	10/00/17	16	Management	Полтехрин	ivii: Kogu			
Proj	roject Management							
147	15/10/15	Monthly mtg 3	Process of Establishment of new	TA Team	TA Experts			
			section/unit		iii Espons			
148	24/03/16	Monthly mtg 6	Re-organization Chart of EDWS	ACE	D. Thwe Naing Oo			
149	27/04/15	Weekly W/S 1	Process of Participatory Project Cycle Management	Expert Team	TA Experts			
150	03/08/15	Weekly W/S 2	PCM Workshop Process	Expert Team	TA Experts			
151	10/08/15	Weekly W/S 3	Vision Mission for YCDC	Expert Team	TA Experts			
152	17/08/15	Weekly W/S 4	Framework of Capacity Development	Expert Team	N/A			
153	17/08/15	Weekly W/S 4	Words in Mission and Vision	Expert Team	N/A			
154	31/08/15	Weekly W/S 6	Proposal of Planning Section	Expert Team	TA Expert			
155	12/10/15	Weekly W/S 8	To Achieve Targets of Water Supply Master Plan	Expert Team	TA Expert			
156	19/10/15	Weekly W/S 9	How to achieve Vision/Objectives - Balance of 4 Perspectives	Expert Team	TA Expert			
157	30/11/15	Weekly W/S 11	TOC - Baseline Survey & Capacity Assessment -	Expert Team	Mr. Ohno			
158	27/01/16	JCC 1	Ideal Future Image: Management Style of Water Supply in Yangon City	JICA Expert Team	Mr. Yoji Matsui			
159	07/09/17	JCC 4	Good Governance, Sustainable utility	Water Supply Division	D. Thwe Naing Oo			
160	26/02/18	JCC 5	PDM Indicators	JICA TA Team	Mr. Sato			
161	01/03/19	JCC 7	Sum/03/y of Morning Section and Discussion	EDWS	D. Thwe Naing Oo			
162	01/03/19	JCC 7	Recommendations and Conclusions of 7th JCC	EDWS	U Myo Thein			
Rep	ort of Tra	ining in foreign co	ountries					
163	06/12/17	Half Monthly mtg 4	Report of training in Japan	Pipe Section 2	U Aung Ko Oo			
164	08/03/18	Half Monthly mtg 6	Report of Training in Tokyo	ACE Daw Aye Pa Pa Nyo and group	Group members			
165	07/09/17	JCC 4	Management Improvement Plan	Supporting Division	D. Thin Thin Soe			

# IV. List of training course in foreign countries

No.	Date	Implementation	Contents	
Outr	ut 1 Wator	agencies Supply Managan	aont	nts
1.	20-29/11/2016	MWA, Thailand	<ul> <li>Institutional Governance and Organization of water utility</li> <li>Overall activities as water supply utility</li> <li>Actions for problem solving (such as leadership)</li> <li>Whole structure of standards, guidelines, and manual, SOPs.</li> <li>Wrap-up Discussions; toward application in Yangon</li> <li>Finance</li> <li>Business plan of water supply utility</li> <li>Standard, guidelines, manuals</li> <li>Human resource development</li> </ul>	10
2.	15-25/01/2017	PPWSA, Cambodia	<ul> <li>Institutional Governance and Organization of water utility</li> <li>Overall activities as water supply utility</li> <li>Actions for problem solving (such as leadership)</li> <li>Whole structure of standards, guidelines, and manual, SOPs.</li> <li>Wrap-up Discussions; toward application in Yangon</li> <li>Finance</li> <li>Business plan of water supply utility</li> <li>Standard, guidelines, manuals</li> <li>Human resource development</li> </ul>	10
3.	23-31/01/2018	Tokyo Waterworks Bureau, TMG	<ul> <li>Institutional Governance, and Financial Autonomy of Water Utility</li> <li>Planning System</li> <li>Fixed Asset Management and Corporate Accounting</li> <li>Laws and Regulations</li> <li>Rules (Duties and Right) on Water Supply</li> <li>Human Resource Development</li> <li>Actions to Materialize the Missions/Master Plan</li> </ul>	9
Outp	ut 2 Distributio	n and NRW Mana	agement, and Billing and Collecting Management	
4.	25/09- 17/10/2017	PPWSA, Cambodia	<ul> <li>New countermeasures as business strategy.</li> <li>Understand procedures and method of construction complete inspection.</li> <li>Understand importance of preventive measures against NRW.</li> <li>Meter reading, Billing, and Tariff collection</li> <li>Non-payment management</li> <li>Customer data management</li> <li>Role of Head Office and Branch</li> </ul>	12
Outp	ut 3 O&M of W	ater Treatment P	lant and Water Quality Management	
5.	12-23/03/2018	PPWSA, Cambodia	<ul> <li>Management of WTP and O&amp;M with SOP</li> <li>Importance of preventive maintenance</li> <li>Planning of water quality monitoring.</li> <li>Monitoring water quality</li> </ul>	5

#### List of participants;

Training Course	No		Name	Position
1. Water Supply Management	1	Mr.	Myo Thein	Deputy Head of Department
(MWA, Thailand)	2	Mr.	Khin Maung Phoo	Assistant Chief Engineer
	3	Mr.	Nay Lin	Executive Engineer
	4	Mr.	Zaw Min	Executive Engineer
	5	Mr.	Than Han	Executive Engineer
	6	Ms.	Aye Pa Pa Nyo	Executive Engineer
	7	Ms.	Moe Moe Khine	Executive Officer (Finance)
	8	Ms.	Khin San Win	Assistant Engineer
	9	Ms.	Yamin	Sub-Assistant Engineer
	10	Ms.	Khin Zin Mar Myint	Programmer
2. Water Supply Management	1	Ms.	May May Thwe	Committee Member
(PPWSA, Cambodia)	2	Mr.	Myint Oo	Head of Department
	3	Mr.	Thet Lwin	Assistant Head of Department
	4	Ms.	Thwe Naing Oo	Assistant Head of Department
	5	Ms.	Thin Thin Soe	Executive Engineer
	6	Ms.	Su Nandar Lin	Assistant Engineer

Training Course	No		Name	Position
	7	Ms.	Khaing Khaing Soe	Sub-Assistant Engineer
	8	Ms.	Ohmma Myint	Sub-Assistant Engineer
	9	Ms.	Aye Pyae Aung	Sub-Assistant Engineer
	10	Ms.	May Thet Kyaw	Accountant -3
3. "Overall Utility Management"	1	Ms.	Aye Pa Pa Nyo	Assisttan Chief Engineer
in Japan	2	Ms.	May Oo Lwin	Executive Engineer
	3	Mr.	Pyi Soe	Executive Engineer
	4	Ms.	Khin Khin Htwe	Executive Engineer
	5	Ms.	Khin Than Oo	Sub-Assistant Engineer
	6	Ms.	Yamin	Sub-Assistant Engineer
	7	Ms.	Khin Zin Mar Myint	Programmer
	8	Ms.	Nyo Nyo Tun Kyaw	Assistant Supervisor
	9	Ms.	May Thet Kyaw	Accountant 3
4. Distribution and NRW	1	Mr.	Myo Thein	Deputy Head of Department
Management, and Billing and	2	Mr.	Thant Zin Oo	Executive Engineer
Collecting Management	3	Ms.	Aye Pa Pa Nyo	Executive Engineering
(PPWSA, Cambodia)	4	Ms.	Aye Aye Mar	Executive Engineering
	5	Ms.	Yu Yu Hla Baw	Assistant Engineer
	6	Ms.	Khin Htay Win	Assistant Engineer
	7	Ms.	Nwe Ni Win	Assistant Engineer
	8	Ms.	Lin Lin Chit	Sub Assistant Engineer
	9	Mr.	Aung Min Oo	Sub-Assistant Engineer
	10	Ms.	Win Sandar Oo	Assistant Supervisor
	11	Ms.	Htwe Htwe Nu	Assistant Supervisor
	12	Ms.	Ms. Win Pa Pa Soe	Account-3
5. O&M of Water Treatment Plant	1	Mr.	Myint Zaw Than	Deputy Head of Depart
and Water Quality Management	2	Mr.	Zaw Win Aung	Assistant Engineer
(PPWSA, Cambodia)	3	Ms.	Tin Zar Lwin	Deputy Supervisor
	4	Ms.	Ei Khine Mon	Assistant Engineer
	5	Ms.	Thidar Su Su Khin	Sub-Assistant Engineer

No	Title of presentation	Presented by	Month/Year	Name of seminar/conference	Venue
1	Challenges and Prospective View of the New YCDC	Ms. Hlaing Maw Oo (YCDC Secretary)	Aug 2017	Executive Forum for enhancing sustainability of urban water service in Asian region	Yokohama
2.	Issues and Challenges of Water Management in Myanmar (Yangon)	Mr. Myo Thein (DYCE)	Sep. 2018	IWA Water Congress	Tokyo
3.	Cooperative improvement of Water Treatment Plant function in Yangon City, Myanmar with Japan	Mr. Zaw Oo (AE)	Oct. 2018	JWWA Annual Research Conference	Fukuoka
4-1	Training effectiveness to retain staff members	Ms. Khin Zin Mar Myint (Assistant Officer)	Nov. 2019	JWWA Annual Research Conference	Hakodate
4-2	Improvement of water quality supply from reservoir	Mr. Zin Min Latt (SAE)			
5-1	Data management structure of Water Resources and Water Supply Authority	Ms. Thin Thin Soe (ACE)	Feb. 2020	P2P (Project to Project) Meeting	Phnom Penh, Cambodia
5-2	Water Supply Regulations, Standards, Guidelines, Manuals and SOPs	Ms. Yu Yu Hla Baw (EE)			

# V. Presentation materials presented by C/P in foreign seminars/conference

資料-4: 定例会議等の実施実績

### 4. Record of Regular Meetings

#### Table of Contents

I.	Contents of Regular Meetings 4-1
II.	Summary of the Number of Participants4-10
(1)	Weekly Workshop and Meetings4-10
(2)	Summary of the Number of Participants of Monthly Meetings

## I. Contents of Regular Meetings

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
Weekly Workshop 1	27/04/2015	01 TA Process of Participatory Project Cycle Management	24
Weekly Workshop 2	03/08/2015	01_TA_PCM Workshop Problem 02_Planning & Finance_Problem Analysis 03_HRD_Problem Analysis 04_NRW_Causes & Effects of Problems/Issues 05_NRW_Problem Analysis 06_WQ_Problem Analysis 07_Water Treatment_Problem Analysis	36
Monthly Meeting 1	04/08/2015	ALL Outputs	19
Weekly Workshop 3	10/08/2015	<ul> <li>01_TA_Vision Mission for YCDC</li> <li>02_Planning_Problem &amp; Objective Analysis Report</li> <li>03_Planing, Guidelines_Objective Analysis Report</li> <li>04_Finance_Objective Analysis Report</li> <li>05_HRD_Objective Analysis Report</li> <li>06_NRW_Objective Analysis Report</li> <li>07_WQ_Objective Analysis Report</li> <li>08_Water Treatment_Objective Analysis Report</li> </ul>	59
Weekly Workshop 4	17/08/2015	<ul> <li>01_TA_Sustainable management and organization in water supply (1)</li> <li>Why independent and self-sufficient</li> <li>02_TA_Framework of Capacity Development</li> <li>03_TA_Words in Mission and Vision</li> <li>04_TA_Necessary Standards&amp;Guideline</li> </ul>	37
Weekly Workshop 5	24/08/2015	01_TA_Sustainable management and organization in water supply (2) - How independent and self-sufficient in other water utilities- 02_TA_Benchmarking & PI 03_Planning_PI (Output 1&2) 04_Planning_PI (Output 3)	54
Monthly Meeting 2	27/08/2015	Annex 1 20150827 Process of Capacity Assessment Annex 2 DRAFT Organization of Non-Revenue Water management Unit Annex 3 Table of Contents of Baseline Survey and Capacity	37
Weekly Workshop 6	31/08/2015	<ul> <li>01_TA_Sustainable management and organization in water supply (3)</li> <li>How independent and self-sufficient in other water utilities-02_TA_Transformation of PPWSA viewed from PIs</li> <li>03_TA_Fukuoka Planning organization</li> <li>04_TA_ Planning Functions of Tokyo Metropolitan Government, Bureau of Waterworks (TMWB)</li> <li>05_TA_Proposal of Planning Section</li> <li>06_Finance_Finance Accounting PIs</li> <li>07_TA_Homework for Baseline survey</li> </ul>	57

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
Weekly Workshop 7	05/10/2015	01_Expert_Japanese Business Trip on Kokkowa Feasibility Study 02_NRW_Township survey Analysis 03_TA_Proposed Location of Flow Meter 04_HRD_Analysis and Finding From Training Record 05_TA_Charactristics of HRD in WSD 06_TA_Standards, Guideline, Manual for Waterworks in Japan 07_CTA_PIs(3)_Performance Indicators Example for Comprehensive PIs	63
Weekly Workshop 8	12/10/2015	00_Agenda_Weekly Meeting 01_NRW_Homework and Township Survey Analysis 02_TA_Concept of GIS/CRM in YCDC 03_TA_Performance Indicators (PI) (4) 04_TA_Progress of Homework in Monthly Meeting	50
Monthly Meeting 3	15/10/2015	00_Planning_Japanese Business Trip on Kokkowa Feasibility Study 01_Planning_Homework Implementation (September) 02_HRD_Homework for September 03_NRW_Monthly Report (September) 04_WQ_Monthly Report (September) 05_TA_3rd Monthly Meeting	40
Weekly Workshop 9	19/10/2015	01_Planning_Progress of Activities 02_HRD_Progress of Activities 03_NRW_PIs_Setting Performance Indicators 04_Output 3_PI 05_TA_Performance Indicators (PI) (5)_Balance of 4 Perspectives	49
Weekly Workshop 10	26/10/2015	00_Agenda of Weekly Workshop 10 01_Water Environment Monitoring Report Presentation 02_NRW_PI_Sales & Collection 03_Finance_Finance & Accounting PI 04_NRW_Pilot Area Survey 05_HRD_List of ideas for training course 06_TA_Performance Indicators (PI) (6)	48
Weekly Workshop 11	30/11/2015	00 TA_Agenda_11th 01 TA_Basics Characteristics of water supply utilities 02 NRW_List of Equipment for NRW 03 TA_TOC - Baseline Survey & Capacity Assessment - 04 HRD_PI 05_WATER SUPPLY ADMINISTRATION FOR BETTER MANAGEMENT OF WATER SUPPLY SERVICES (B)Training Report 06 NNZ_HORIBA's Analyzer Training Internship Program	58
Monthly Meeting 4	03/12/2015	01_TA_4th Monthly Meeting_Main 02_Planning_Montly Report 03_HRD_Activities in Oct & Nov 04_NRW_Township Survey Results and Pilot Area Survey 05_Finance_Monthly Report (Finance & Accounting) 06_Design of distribution flow management system(Flow meter installation)	50
Weekly Workshop 12	08/12/2015	00_TA_Agenda_12th 01_TA_Regulation for water supply utilities(Basics of water supply utilities (2) 02_Finance_Performance Indicator 03_WQ_Performance Indicator for October & November 04_WQ_Water Environment Monitoring Training Report 05_Planning_Report for LGOTP Training Program (Waterworks)	40
Weekly Workshop 13	14/12/2015	00_TA_Agenda_13th 01_TA_Asset Management and Accounting For water supply utilities (Basics of water supply utilities (3)) 02_TA_PI format_Data and Performance Indicator	45
Weekly Workshop 14	21/12/2015	00_TA_Agenda_14th	40
Meeting Name	Meeting Date	Title of Presentation         No. of Participa	
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		01_TA_Rate making of Water tariff_Basics of water supply utilities (4)	
Monthly Meeting 5	22/12/2015	02       1A       Ideal Future of EDWS         01_TA_Main_5th monthly meeting_rev         02_Planning_December       Monthly         Report       of         November         Activities         03       WQ         Water Quality Monitoring	55
Weekly Workshop 15	18/01/2016	01_TA_Agenda & Program schedule 01_Finance_Current Situation of Finance 02_HRD_Ideal Future Image of EDWS/HRD 04_NRW_Leakage Control (D)	52
Weekly Workshop 16	19/02/2016	00_TA_Agenda & Program Schedule 01_NRW_Pilot Area Survey 02_HRD_Progress of activities 03_WTP_REPORT FOR 1ST SEMINAR OF WATER QUALITY MANAGEMENT	51
Weekly Workshop17	21/03/2016	01_TA_Agenda & Program Schedule 02_Planning_Progress of Activities 03_Finance_Why and How to make asset accounting? 04_HRD_Progress Report 05_WTP_Water treatment standards and technology 06_Laos Report	50
Monthly Meeting 6	24/03/2016	01_TA_6th Monthly Meeting02_Planning_Monthly Report03_Finance_Why and How to make Asset Accounting04_HRD_Progress Report05_NRW_Progressive of Activities on Yankin Pilot Project06_WQ_Report on the 2nd Seminar of Water QualityMonitoring07_TFT_Activities on Water Treatment Technology08_Re-organization Chart of EDWS in YCDC	58
Weekly Workshop 18	04/04/2016	01_TA_Agenda & Program schedule 02_Finance_Water Supply and Electricity Supply 03_Finance_What Finance Section doing & Importance of Finance in water supply 04_NRW_Progressive of Activities on Yankin Pilot Project 05_DRAFT OF WATER QUALITY MONITORING PLAN	39
Weekly Workshop 19	23/05/2016	01_TA_Agenda & Program schedule 02_WQ_SUMMARY_OF_CHLORINE_FACILITIES_AND DISINFECTION 03_WTP_Water Treatment 04_HRD_Training Course Progress 05_TA_Customer Service & Public Relation_(Part 1)	51
Weekly Workshop 20	31/05/2016	01_TA_Agenda & Program schedule         02_Planning_Progress of Activities         03_Finance_Progress of Activities         04_NRW_Progress of Homework         05_WTP_Water Treatment Plant Management using water         quality data         06_TA_Customer Service & Public Relation (Part 2)         07_TA_How to cope with accumulated Burden of capital         expenditure	62
Monthly Meeting 7	14/06/2016	01_TA_7th Monthly Meeting02_Planning_Progress of PI Data collection03_Finance_Progress of Homework04_HRD_Report of New Staff Training05_CS&PR_Establishment of Customer Service Division(Team A+B)06_NRW_Progress of Activities07_WQ_Progress of Water Quality monitoring Plan andReport of WQ Analysis08_Pipe repairing & laying works	52
Weekly Workshop 21	04/07/2016	01_1A_Agenda & Program schedule 02_NRW_Progress of NRW Activities 03_HRD_Progress of Activities	60

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
		04_WQ_Brief Explanation of water Quality monitoring 05_WOM_Progress of Activities_Nyaungnapin WTP	
Weekly Workshop 22	11/07/2016	01_TA_Agenda & Introduction of Design Criteria for Water Supply Facilities of Japan 02_Planning_Progress of Activities 03_NRW_Preparation of Flow Meter Installation 04_WTP_Progress of Activity (Ngamoeveik WTP)	46
Monthly Meeting 8	14/07/2016	01_TA_8th monthly meeting         02_Planning_Progress of PI monitoring and issues         03_HRD_Progress of Activity         04_CS_Establishment of Customer Service Team         04_PR_Consideration of newsletter contents and improvement         of EDWS website         05_NRW_Progress of NRW activities         06_WQ_Using Standard Operation Procedures (SOPs) in the         laboratory and Nyaunghnapin WTP         07_TFT_Filter Improvement Plan for Ngamoeveik WTP	
Weekly Workshop 23	21/07/2016	01_TA_Agenda Program schedule 02_HRD_Previous Meeting Review 03_TA_Procurement of Equipment 04 Planning Existing Design Criteria	48
Weekly Workshop 24	02/08/2016	00_TA_Agenda Program schedule01_Finance_Review of previous meeting02_HRD_Progress of Activities03_PR_Improvement of Internal Communication04_TA_Public Relation (3)05 Planning Progress of activities	28
Weekly Workshop 25	08/08/2016	00_TA_Agenda Program schedule 01_WQ_24th Meeting Record 02_NRW_Progress of NRW 03_HRD_Progress of Activities	52
Weekly Workshop 26	05/09/2016	01_NRW_25th Meeting Review 02_All Team_Utilization Plan of Reference Books 03_HRD_Plan of 2nd Training Course by HRD 04_Finance_YESC Report 05_TA Team_Computer training 06_TA Team_Training Plan 07_Yegu PS_Improvement of the Pipeline for Kabar Aye Pagoda Road and Yankin Township Management Guidance 08_Operation And Maintenance Of Urban Water Supply System and Loss of Books & Utilization 09_TFT_Activities of Task Force Team (Filter Improvement)	
Weekly Workshop 27	12/09/2016	00_TA_Agenda Program         01_CS & PR Section_26th meeting Review         02_Planning_Progress of Activities         03_HRD_Progress of Activities         04_NRW_Utilization Plan of Referential books         05_Lagunpyin Rsvr_Report of Training in Japan         06_WQ_Operation And Maintenance Of Urban Water Supply         System         07_TA Team_Procurement of Equipment and Back Hoe         Training	74
Monthly Meeting 9	07/10/2016	00_8th Monthly Meeting review 01_TA_9th Monthly Meeting 02_Planning_Progress of Activities 03_HRD_Progress of Activities 04_NRW_Progress of NRW Activities 05_NRW_Progress of flow meter installation	54
Weekly Workshop 28	17/10/2016	2016       00_TA_Agenda Program         01_Planning_27th meeting review         02_TA_Combined all PPs of Expert         03_HRD_Progress of Activities         04_Task Force Team_Progress of Activities         05_TA_Progress_of_procurement_water_quality_equipment	

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
		(Phase 1)	
Weekly Workshop 29	31/10/2016	00_TA_Agenda Program 01_Finance_Review of Previous Meeting 02_HRD_Progress of Activities 03_Water Quality_Report of NNP WTP 04_WQ_Action Plan	40
Weekly Workshop 30	31/10/2016	00_TA_Agenda Program         01_Planning_Progress of Activities         02_Finance_Progress of Tariff Setting Study         03_HRD_Progress of Activities         04_ ComputerSection_Progress of e-Government on Water         Tariff Collecting and Customer Data Management         05_NRW_Progress of NRW Activities         06         07	
Monthly Meeting 10	07/11/2016	00_9th monthly Meeting Review 03_Planning_Progress of Activities 04_NRW_Progress of NRW Activities 05_WQ_Progress of October Activities 06 TFT Activities	72
Monthly Meeting 11	13/12/2016	<ul> <li>00_10th monthly meeting Review</li> <li>01_TA_11th monthly meeting All</li> <li>02_Planning_Monthly Data Collection and Check List</li> <li>03_CS_Progress of Activities</li> <li>04_NRW_Progress of NRW Activities</li> <li>05_WQ_Residual Chlorine Monitoring Activity</li> <li>06_WTP_Activities of Water Treatment Section</li> <li>07 Report on MWA Training, Thailand</li> </ul>	52
Weekly Workshop 30	19/12/2016	00_TA_Agenda Program 01_CS&PR_Review of Previous Meeting 02_Finance_Activities of Progress 03_NRW_Actioin Plan 04_ Customer Service_Progress of e-Government on Water Tariff Collecting and Customer Data Management 05_NRW_Progress of NRW Activities 06_HRD_Training Report_Water Supply Administration for Better Management of Water Supply Services	49
Weekly Workshop 31	19/12/2016	00_TA_Agenda Program 01_CS&PR_Review of Previous Meeting 02_Finance_Activities of Progress 03_NRW_Actioin Plan (Training Program on Non Revenue Water Management (Leakage Control) (C)) 04_Planning_Proposal for Manual Books of Window & MS_rev 05_Proposals for PC from each section	46
Weekly Workshop 32	26/12/2016	00_TA_Agenda Program 01_NRW_Review of Previous meeting 02_Planning_Progress Activities 03_HRD_Outline of YTU Lecture 04_HRD_Review of MWA Training 05_CS_Making Guideline on Billing & Collection 06_PR_Progress Activities 07_TA_Preparation small laboratory 08_GIS_Outline of GIS Seminar & GIS Utilization in EDWS	43
Weekly Workshop 33	09/01/2017	00_33rd Agenda 20170109 01_Review of 32nd Weekly Meeting Record 02_WQ_Preparation small laboratory 03_HRD_Activities 04_Taskforce_Sieving machine Presentation 05_Report of Japan training and Action Plan	34
Monthly Meeting 12	07/02/2017	00_TA_Main_12th_agenda_rev1 01_11th monthly meeting {Record} by Customer Service Team 02_Review of PPWSA 03_Planning_Progress of Activities and Review of JCC on necessary Plans and Rules(RSGMs)	38

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
		04_Finance_How to make plan, Guideline and Activities for	•
		next three months	
		05_HRD_Monthly Report 06_CS_Next three months activities	
		07 PR Planning for PR Section	
		00_TA_Main_13th_agenda	
		01_NRW_12th monthly meeting {Record}	
Monthly Meeting 13	29/03/2017	02_NRW_Progress of Activities	64
		03_Planning_Progress of activities 04_HPD_Progress of activities_DK7MM	
		01 TA 14th monthly Meeting Expert Main	
		02 13th Monthly meeting record by output-3(Water treatment	
		Section)	
		03_Planning_Progress Activities	
		04_Finance_Progress of Activities	
Monthly Meeting 14	26/05/2017	05_HRD_Progress of Activities	19
Wonding Weeting 14	20/03/2017	07 CS Data from Survey in Townships and D&R of New	
		Expert	
		08_NRW_Progress Report	
		09_WT_baseline report	
		10_WQ_Progress of Activities	
		11_IF1_SLUDGE REMOVAL RECORD PP	
		03 Planning Planning & Regulation progress report	
		04 Finance Progress of activities	
		05_HRD_Progress of Activities	
		06_CS_Data from survey in Townships and D&R	
		07_PR_Progress of Activities	- 1
Monthly Meeting 15	23/06/2017	08_NRW_Progress of report	51
		09_1F1_Progress of report	
		11 TFT Gyophu Improvement	
		12 WQ ACTION PLAN OF CENTRAL LABORATORY	
		13_WQ_Progress & Plan Activities of Water Quality	
		Management	
XX 11 XX 1 1 24	05/07/2017	01_TA_34th Weekly Meeting Expert Main	25
weekly workshop 54 05/07/201		02_CS_Case_in_tokyo	35
		01 Meeting review Financne	
		02 TA 35th Weekly Meeting Expert Main	
Weekly Workshop 35	17/07/2017	03_Planning_Progress of Activities	46
		04_HRD_Progress of Activities_NNTK	
		05_NRW_Progress of Activities_KZH	
		01_Finance_15th meeting review 02_TA_16th monthly Monting Export Main final	
		02_IA_10th monthly Meeting Expert Main Infai 03 Planning Progress of Activities	
Monthly Meeting 16	27/07/2017	04 HRD Progress of Activities	56
		05_PR_Progress of Activities	
		06_NRW_Progress	
		07_WQ_Report of Progress of Activities	
		01. HRD_16th Meeting Review by HRD	
		02. IA_1/in monthly Meeting Expert Main linal	
		04. HRD OJT	
Monthly Meeting 17	09/08/2017	05. Finance Progress of Activities	65
		06. NRW_progress of activities and future plan	
		07. Gyophu Improvement_U ZML	
		08. Removing sludge	
		1_1st Half Monthly Meeting Review	
2nd Half Monthly		2 IA_2nd monthly Meeting Expert Main 3 HPD Progress of activities	
Meeting	28/09/2017	4 WTP Progress of Sludge Removing at NNP WTP	-
incening		5 WTP Comparison of ACH & PAC Report	
		6 WQM Review the residual chlorine monitoring results	

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
		7_WQM_Japan Training Report 8_Planning_TrainingReport_Operation and maintenance of Unkern Water Sumply system	
3rd Half Monthly Meeting	15/11/2017	00_TA_3rd HMM Expert Main         01_Review of 2nd half monthly meeting         02_Planning_Progress of Activities_Daw Khin San Win         03_Finance_Review of Finance Seminar         04_HRD_Progress of activities         05_CS_Overdue Manag_D. LLC         06_NRW_progress of activities         07_Reservoir_direct filter         07_Reservoir_Gyophu Improvement 6_U ZML         09_Finalization of Management Plan_ACE_DawTTSoe         10_NRW_Progress and Schedule of Steering Committee-1         Daw HHN10_NRW_Progress and Schedule of Steering Committee-1         11_Schedule of preparation, table of content of NRW MP, and Key points of Recommendation for PPWSA report         12_Reservoir_Inspection of Kiosk and Flow meter chamber	65
Monthly Meeting 10	26/11/2017	01_TA_10th monthly meeting All 02_HRD_Progress of Activities	-
4th Half Monthly Meeting	06/12/2017	00_TA_4th HMM Expert Main1. Review of 3rd half monthly meeting02_HRD_Progress of Activities03_Finance_Progress of Activities04_PR_Progress of Activities05_NRW_Progress of Activities06_WQ_Progress of Activities07_Improvement Plan Presentation by U Aung Ko Oo	56
5th Half Monthly Meeting	16/01/2018	00_TA_5th HMM Expert Main_rev 01_Review of previous meeting 2.1_Planning_Progress of Activities 2.2 Customer Service_Progress of Activities 2.3_NRW_Progress of activities 2.4. Progress of RPF 2.5_WQ_Progress of Activities 03_Preparation of Chlorination in YCDC	35
6th Half Monthly Meeting	08/03/2018	00_TA_6th HMM Expert Main01_Review of 5th half monthly meeting(TFT)02_HRD_Progress of Activities03_Planning_Progress of Activities04_PR_Progress of Activities05_Customer Service_Progress of Activities06_CS_Complaint sheet_sample07_TA_Issues to be share_Mr Saitou08_Report of Training in Tokyo09_Report of Training in PPWSA10<	39
7th Half Monthly Meeting	23/05/2018	00_TA_7th HMM Expert Main01_Planning_Review of 6 half monthly meeting02_Planning_Progress_Daw Khin San Win03_HRD_Progress_Daw Nyo NYo Tun Kyaw04_CS_Progress04_NRW_Progress of activities06_WTS_ACH Jartest of Nyaungnapin WTP07_WTS_Plan for Sludge Management08_WTS_Gyophu Filtration Procedure09_WQ_Review Small lab data	54
8th Half Monthly Meeting	07/06/2018	00_TA_8th HMM Expert Main01_Finance_Meeting Review02_HRD_Progress report03_NRW_Minimum night flow test04_WTS_Gyophu Filtration Procedure1(Reservoir)_U ZML05_WQ_Progress Report_06 TA Residual Chlorine	63

Meeting Name	Meeting Date	Title of Presentation         No. of Participation	
9th Half Monthly Meeting	09/07/2018	00_TA_9th HMM Expert Main 01_Review_HRD 02_Planning_Progress_D KSW 03_Finance_Progress_D MTK 04_Customer Service_Progress_D WPPS 05_NRW_Progress_U Kaung Htet Zaw 06_WTP_Pilot Basin Operation_U Thit Lwin 07_RSGM_WG - 3_Daw May Myat Thaw 08_Heroshima Training_water quality_Daw Thandar Myat	45
10th Half Monthly Meeting	24/08/2018	00_TA_10th HMM Expert Main 01_CS_Review 01_WTP_Phase one sludge level_U Thit Lwin 02_WT_Gyophu Filtration Operation3 03_WQ_Progress_D. NNZ 04_WT_Making SOP_U Zaw Win Aung 06_PR_Progress_Daw Ohmar Aung 07_NRW_Progress 07_NRW_Progress	62
11th Half Monthly Meeting	20/09/2018	00_TA_11th HMM Expert Main 01_Review by NRW 02_Planning_MTP-Major activity_DKSW 03_Pipe 3_Japan Training Report_U Tun Tun Hlaing 04 TA_11th HMM Expert Main_all	61
12th Half Monthly Meeting	14/12/2018	00_TA_12th HMM Expert Main 01_Review_Water Quality 02_Planning_Progress 03_WG 3-1 (Regulations)_Progress 04_Finance_Progress 05_HRD_Progress 06_CS_New Database Management_D. WPPS 07_NRW_Progress 08_Direct Filtration_Progress	61
13th Half Monthly Meeting	18/01/2019	00_TA_13th HMM Expert Main 01_Review of 12th HMM 02_Planning 03_Activities of Progress 04_Progress of WQ 05_Pilot Project training plan	57
14th Half Monthly Meeting	20/02/2019	00_TA_13th HMM Expert Main 01_Review of 13half monthly meeting 02_Progress of HRD 03_Progress of PR 04_Progress of activities 05_Gyophu Filtration Operation 06_SOP PRESENTATION	50
15th Half Monthly Meeting	17/05/2019	RSGM Progress of Activities TA Request to make notes for Regulation Planning Section SOP Progress HRD Progress of Activities Finance Progress of Activities	43
16th Half Monthly Meeting	18/06/2019	Planning Progress of Activities SC3 RSGM Progress of Activities Finance Growing City & Accumulation of Loan HRD Progress of Activities PR Progress of Activities NRW Progress of Yankin Pilot Project Water Quality Progress of Activities Transmission and Distribution Management Progress of Procurement Equipment	49
17th Half Monthly Meeting	09/07/2019	9 CS Progress of Activities NRW Progress of Activities TFT Pilot filter improvement and report (one-year research) Comparison of Turbidity Meters 35	
18th Half Monthly Meeting	06/08/2019	Planning Progress of Activities Regulation Progress of Activities	46

Meeting Name	Meeting Date	Title of Presentation I	
		CS New Customer Database	
		HRD Progress of Activities	
		NKW Progress of Yankin Pilot Project Water Quality Training Report	
		CS Meter Reading & Collection Work Manual	
		Yegu Full scale application of SOPs	
19th Half Monthly	28/08/2010	Report of Training in Japan (D Thiri Aung Latt)	20
Meeting	28/08/2019	Report of Training in Japan (D Thida Su Su Khin)	39
		Report of Training in Japan (U Saw Sein Aye)	
204 11 1016 411		Progress of installation of flow monitoring system	
20th Half Monthly	01/10/2019	HKD Progress of Activities	33
wiedling		Progress of Planning Section	
21st Half Monthly	20/11/2019	Conference Report; HRD	33
Meeting		Conference Report. Reservoir water treatment	
		Overview of Task Force Team (Improvement of filtration basin	
		in NNP WTP)	
22nd Half Monthly	17/12/2019	PR Progress of Activities	39
Meeting		Transmission and Distribution Progress of Activities	
		Progress of Flow Monitoring System Installation Preparation for Terminal Evaluation and AC member visit	
		Progress of Activities (HRD Planning CS Regulation PR	
00.111.1016.11		NRW, GIS, WO)	
23rd Half Monthly	05/03/2020	New Chlorination facilities	40
Meeting		Confirmation of Recommendations – Terminal Evaluation of	
		TA project	
		Decision of JICA on the project and proposed schedule by	
		Experts Programs of activities and impost of COVID 10 to the programs	
		by	
		- Planning section	
24th Half Monthly		- Finance section	
	10/08/2020	- HRD section	
Meeting	19/08/2020	- Public Relation Section	38
(Video Conference)		- Customer Service section	
		- NRW management section	
		- water Quanty Monitoring Section	
		- Water Treatment Section	
		Remaining activities and outputs (Plans, reports, etc) and	
		schedule by Experts	
		Monitoring activities of Mid-term Plan by Planning Section	
		Progress of implementation of HRD plan by HRD section	
		Progress of future plan of Customer Service Management	
25th Half Monthly	17/09/2020	Progress of NRW management plan by NRW management	
Meeting	17/09/2020	Section	40
(Video Conference)		Progress of Water Quality Management Plan by Water	
		Treatment Section and Central laboratory	
		Activities of Transmission and Distribution Management	
		Section	
		Progress of Water Quality Management Plan	
		Section	
26th Half Monthly		Status Water Supply Regulations	
Meeting	04/11/2020	Status of SOP for all sections	49
(Video Conference)		Status of Sop/Manuals for NRW management	
		Status of Sop/Manuals for WQ management	
		Research Report of Master Course (D Ei Khai Mon)	
		Research Report of Master Course (D Khai Khai Soe)	
27 <sup>th</sup> Half Monthly		Financial Results in 2019/20 FY (Finance Section) Progress of trial of new customer database and expansion plan	
Meeting	22/12/2020	Progress of HRD (HRD section)	51
(Video Conference)		Progress of NRW management Plan, Online Training	51
		materials, TOT	

Meeting Name	Meeting Date	Title of Presentation	No. of Participants
		Progress of Water Quality Management Plan	
		Activities of Transmission and Distribution Management	
		Section	
		COVID-19 response activities by JICA Myanmar Office	
		Other Business – Extension of JICA TA Project, New activities	
		(PPP) and new expert, Next JCC	

#### II. Summary of the Number of Participants

#### (1) Weekly Workshop and Meetings

N.	Dete	Number of
INO.	Date	attendance
1	27.7.2015	24
2	3.8.2015	36
3	10.8.2015	56
4	17.8.2015	37
5	24.8.2016	54
6	31.8.2015	57
7	5.10.2015	63
8	12.10.2015	50
9	19.10.2015	49
10	26.10.2015	48
11	30.11.2015	58
12	8.12.2015	40
13	14.12.2015	45
14	21.12.2015	40
15	18.1.2016	52
16	19.2.2016	51
17	21.3.2016	50
18	4.4.2016	39
19	23.5.2016	51
20	31.5.2016	62
21	4.7.2016	60
22	11.7.2016	46
23	21.7.2016	48
24	2.8.2016	28
25	8.8.2016	52
26	5.9.2016	67
27	12.9.2016	74
28	17.10.2016	52
29	31.10.2016	40
30	5.12.2016	49
31	19.12.2016	46
32	26.12.2016	43
33	9.1.2017	34
34	5.07.2017	35
35	17.07.2017	46
		1,682

No.	Date	Number of attendance	Remarks
1	4.8.2015	19	Monthly
2	27.8.2015	37	Monthly
3	15.10.2015	40	Monthly
4	4.12.2015	50	Monthly
5	22.12.2015	55	Monthly
6	24.3.2016	58	Monthly
7	14.6.2016	52	Monthly
8	14.7.2016	63	Monthly
9	7.10.2016	54	Monthly
10	7.11.2016	72	Monthly
11	13.12.2016	52	Monthly
12	9.2.2017	38	Monthly
13	28.03.2017	64	Monthly
14	25.05.2017	49	Monthly
15	21.06.2017	51	Monthly
16	27.07.2017	56	Monthly
1	09.08.2017	65	Half monthly
2	28.09.2017	53	Half monthly
3	15.11.2017	65	Half monthly
4	06.12.2017	56	Half monthly
5	16.01.2018	35	Half monthly
6	08.03.2018	39	Half monthly
7	23.05.2018	54	Half monthly
8	07.06.2018	63	Half monthly
9	12.07.2018	45	Half monthly
10	24.08.2018	62	Half monthly
11	20.09.2018	61	Half monthly
12	14.12.2018	61	Half monthly
13	18.01.2019	57	Half monthly
14	20.02.2019	50	Half monthly
15	17.05 2019	43	Half monthly
16	18.06.2019	49	Half monthly
17	09.07.2019	35	Half monthly
18	06.08. 2019	46	Half monthly
19	28.08.2019	39	Half monthly
20	01.10.2019	33	Half monthly
21	20.11.2019	33	Half monthly
22	17.12.2019	39	Half monthly
23	05.03.2020	50	Half monthly
24	19.08.2020	38	Half monthly
25	17.08.2020	40	Half monthly
26	04.11.2020	49	Half monthly
27	22.12.2020	51	Half monthly
Total (43)		2,121	

#### (2) Summary of the Number of Participants of Monthly Meetings

資料-5: 供与機材・携行機材実績

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#### **Table of Contents**

I.	Output 15-1
II.	Output 254
H.	Output 3

#### I. Output 1

### (1) Equipment list

No.1-1 Equipment for local offices for collection of electric data and calculation of PIs (Part 1)

Place of installation: Computer section of WRAWSA Date of handover: 24 Aug. 2016

1     Personal computer (Desktop)+UPS       2     Printer (laser, A4) for local stations       3     Copy machine (A3 color) for training room       4     MS office       5     Anti-virus software       6     USB stick       7     Consumable (laser A4)       8     Consumable (copy machine tonner, drum cartridge	No.	Item	Qty
2     Printer (laser, A4) for local stations       3     Copy machine (A3 color) for training room       4     MS office       5     Anti-virus software       6     USB stick       7     Consumable (laser A4)       8     Consumable (copy machine tonner, drum cartridge	1	Personal computer (Desktop)+UPS	59
<ul> <li>3 Copy machine (A3 color) for training room</li> <li>4 MS office</li> <li>5 Anti-virus software</li> <li>6 USB stick</li> <li>7 Consumable (laser A4)</li> <li>8 Consumable (copy machine tonner, drum cartridge</li> </ul>	2	Printer (laser, A4) for local stations	49
<ul> <li>4 MS office</li> <li>5 Anti-virus software</li> <li>6 USB stick</li> <li>7 Consumable (laser A4)</li> <li>8 Consumable (copy machine tonner, drum cartridge</li> </ul>	3	Copy machine (A3 color) for training room	1
5     Anti-virus software       6     USB stick       7     Consumable (laser A4)       8     Consumable (copy machine tonner, drum cartridge	4	MS office	59
6         USB stick           7         Consumable (laser A4)           8         Consumable (copy machine tonner, drum cartridge	s.	Anti-virus software	59
7         Consumable (laser A4)           8         Consumable (copy machine tonner, drum cartridge	6	USB stick	49
8 Consumable (copy machine tonner, drum cartridge	7	Consumable (laser A4)	49
	8	Consumable (copy machine tonner, drum cartridge	1

No.1-2 Equipment for local offices for collection of electric data and calculation of PIs (Part 2)

Place of installation: Computer section of WRAWSA Date of handover: 20 Feb. 2017

No.	Item	Qty
1	Personal computer (desktop) and UPS	5
2	Personal computer (laptop)	8
3	Printer (laser, black & white, A4) for local stations	1

No.1-3 Manuals and reference books (PC related) (Long term expert procurement)

Place of installation: Computer section of WRAWSA

Date of handover: 9 Feb. 2017

 No.	Item	Qty
1	Microsoft Office Ward 2016	60
2	Microsoft Office Excel 2016	60
3	Microsoft Office Power point 2016	60

No.	Item	Qty	
4	Using Windows 8	60	

No.1-4 GIS software

Place of installation: GIS section of WRAWSA

dover: 23 Feb. 2017	Item	A unitIO confirment
Date of ha	No.	-

Qty

vare	
S softw	
ArcGl	
_	

No.1-5 Auto CAD software

Place of installation: GIS section of WRAWSA

Date of ha	ndover: 21 Mar. 2017	
No.	Item	Qty
1	Auto Cad 2017 LT	2

No.1-6 Flow monitoring system (JICA procurement)

Place of installation: 9 sites in Yangon waterworks facilities Date of confirmation of package (at YCDC): 23 Aug. 2018

	· · · · · · · · · · · · · · · · · · ·	
No.	Item	Qty
1	Fixed ultrasonic flow meter	
1-1	Flowmeter main unit (UFL-30)	21
1-2	Transducers with 5m cable (SE044040NC)	42
1-3	Mounting fixtures for transducers	21
14	Coaxial Cable 20m 5C-2WAE	2
1-5	Coaxial Cable 30m	4
1-6	Coaxial Cable 40m	2
1-7	Coaxial Cable 50m	2
1-8	Coaxial Cable 60m	2
1-9	Coaxial Cable 70m	2
1-10	Coaxial Cable 100m	2
1-11	Coaxial Cable 110m	2
1-12	Coaxial Cable 120m	2
1-13	Coaxial Cable 130m	4
1-14	Coaxial Cable 140m	2
1-15	Coaxial Cable 150m	4
1-16	Coaxial Cable 170m	4
1-17	Coaxial Cable 210m	2
1-18	Coaxial Cable 240m	4
1-19	Coaxial Cable 270m	2
1-20	Documents of Ultrasonic Flowmeter	1
1-21	Coaxial Cable 300m for the existing Ultrasonic Flowmeter	1
1-22	Coaxial Cable 220m for the existing Ultrasonic Flowmeter	1
1-23	Coaxial Cable 750m	-

No.	Item	Qty
1-24	Scotch Cast	40
2	Field data collection system	
2-1	Enclosure (cabinet)	6
2-2	Remote Terminal Unit (RTU)/Model: DLM	6
2-3	Uninterruptible Power Supply (UPS)/Model: APC Smart UPS RT1000	6
2-4	GPRS/GSM Router/Model: RV50	6
2-5	Automatic Voltage Regulator (AVR)/Model: SVC-234.3	6
2-6	Isolation Transformer (IT)/Model: TF425376	6
2-7	Power Supply Cables/Model: CA-1757-P001-00	23
2-8	Signal Cables/Model: CA-1757-S001-00	23
3	Central data collection system	
3-1	PC/Model: Precision Tower 3420	1
3-2	Monitor	1
3-3	Notebook PC/Model: Latitude 5580	1
3-4	Uninterruptible Power Supply (UPS)/Model: APC Smart UPS RT1000	1
3-5	Battery pack/Model: SURT48XLBP	1
3-6	GPRS/GSM Router/Model: RV50	1
3-7	Automatic Voltage Regulator (AVR)/Model: SVC-234.3	1
3-8	Color Laser Printer/Model: M552dn	1
3-9	Table	1
3-10	Chair	1

## (2) Handover document

## Handover document: Attachment 1

No	Ninhar ond non-a of accurate the most pro-	Procurement	Handover
.01		by	document
1-1	Equipment for local offices for collection of electric data and calculation of PIs (Part 1)	Consultant	Yes
1-2	Equipment for local offices for collection of electric data and calculation of PIs (Part 2)	Consultant	Yes
1-3	Manuals and reference books (PC related)	Long term expert	Yes
1-4	GIS software	Consultant	Yes
1-5	Arc GIS software	Consultant	Yes
1-6	Flow monitoring system	JICA	Confirmation report of package

#### II. Output 2

### (1) Equipment list

No.2-1 Equipment related to NRW management (Excavator)

Place of installation: Yegu PS

Date of h	ndover: 20 Sep. 2016	
No.	Name of Item	Qty
1	Back Hoe	1

No.2-2 Equipment and materials for NRW management (JICA procurement)

Please of installation: site of work of NRW management

ate of he	and over:	
No.	Name of Item	Qty
1	Water Pipe Camera NH-40 and accessories	1
2	Water Pipe Drilling Machine A2SA2-15 and accessories	1
3	Water Leakage Survey Instrument LC-2500	1
4	Tee with Valve	
4-1	TN-65VS 10inch x 150mm	2
4-2	TN-65VS 150mm x 75mm	2
5	Gate Valve Ductile	
5-1	Flange type 150	3
5-2	Flange type 100	1
5-3	Flange type 75	3
9	Gate Valve	
6-1	Type for PVC 150	6
6-2	Type for PVC 100	15
6-3	Type for PVC 75	5
64	Type for PVC 50	3
7	Gate Valve Case	
7-1	Gate Valve Case NVKNS-15G-39LU	20
7-2	Bottom Plate A-1	20
8	Ductile Iron Deformed Pipe	
8-1	Type K Flanged Socket 150	4
8-2	Type K Flanged Socket 100	2
8-3	Type K Flanged Socket 75	2
8-4	Type K Flanged Spigot 150	9
8-5	Type K Flanged Spigot 100	2
8-6	Type K Flanged Spigot 75	2
8-7	Double Flanged Pipe 150 x 300L	2
8-8	Double Flanged Pipe 150 x 400L	2
8-9	Double Flanged Pipe 100 x 400L	1
8-10	Double Flanged Pipe 75 x 400L	3
8-11	Double Flanged Pipe 75 x 250L	2
8-12	Double Flanged Pipe 75 x 150L	2
6	Ductile Iron Straight Pipe	
9-1	Type K-1 150 x 5000L	80
9-2	Type K-1 100 x 4000L	3
9-3	Type K-1 75 x 4000L	8
10	Push Ring, Rubber Ring, T-bolt	
10-1	Push Ring, Rubber Ring, T-bolt set 150	06
10-2	Push Ring, Rubber Ring, T-bolt set 100	5
10-3	Push Ring, Rubber Ring, T-bolt set 75	15
Ξ	Ductile Iron Deformed Pipe	
1-11	Type K Bend 90° 150	ŝ
11 2	T.m. V D.m.d 150	10

Vo. 24.8	Name of Item	Qty
24-8 24-0	Bend 45° VF 150 Band 271/7° VD 150	10
24-10	Bend 111/4° VP 150	10
24-11	Bend 45° VP 100	20
24-12	Bend 221/2° VP 100	30
24-13	Bend 111/4° VP 100	30
24-14	Bend 45° VP 75	10
24-15	Bend 221/2° VP 75	10
24-16	Bend 111/4° VP 75	10
24-17	Bend 45° VP 50	9
24-18	Bend 221/2° VP 50	9 4
24-19	Bend 111/4* VP 30 Metal Ethios for Tainias Balaniand Chlorida Bios	4
22 25-1	Medal Fitung to Joining Polyvinyi Chionde Fipe TH-201.150	30
C-20	TH-301 100	00
25-3	TH-301.75	20
25-4	TH-30L 50	20
26	Polyvinyl Chloride Pipe Joint Bend	
26-1	Bend VK-00B 150×45°	15
26-2	Bend VK-00B 150×22 1/2°	12
26-3	Bend VK-00B 100×45°	15
264	Bend VK-00B 100×22 1/2°	15
26-5	Bend VK-00B 100×11 1/4°	10
26-0	Bend VK-00B /5×45° Doub 75×73 1700	0 4
7-07	Bend VR-00B 75×21 1/2 Bend VK-00B 75×11 1/4°	0 9
0-07	Bend VK-00B 50×45°	04
26-10	Bend VK-00B 50 x 22 1/2°	4
26-11	Bend VK-00B 50 x 11 1/4°	4
27	Polyvinyl Chloride Pipe Joint VS Joint	
27-1	VS Joint 150	5
7-17	VS Joint 100 VS Joint 75	8 7
C-12	VS Ioint 50	0 9
. 8	Different Pipe Joint	,
28-1	SHINO Flex 150	4
28-2	SHINO Flex 100	5
28-3	SHINO Flex 75	4
28-4	SHINO Flex 50	4
6	Polyvinyl Chloride Pipe Joint VS Cap	•
29-1	VS Cap 150	7 -
7-67	VS Cap 100 VIS C 75	- ,
C-67		<b>v</b> 4
	Saddle Snap Tap	
30-1	WXD150X Size20	5
30-2	WXVS150X Size20	32
30-3	WXVS150X Size25	5
30-4	WXVS100X Size20	120
30-5	WXVS100X Size25	10
30-6	WXVS100X Size30	s, r
30-7	WXVS100X Size40	s 5
30-0 30-0	WAVS75X SIZE2U WYVS75X Size2	0C 3
30-10	WXVS50X Size20	30
30-11	WXVS50X Size25	5
1	Socket for Tap and Stop Valve	
31-1	ISS Size20	245
31-2	1SS Size25	25
31-2	ISS Size30	2
314	ISS Size40	5
1 5	Polyethylene Pipe Metal Joint 1.00 دانین میراد.	250
52-1	10S SIZe20	007

11-3	Type K Bend 45° 100	4
11-4	Type K Bend 45° 75	12
11-5	Type K Bend 221/2° 150	8
11-6	Type K Bend 221/2° 75	10
11-7	Type K Bend 111/4° 150	10
11-8	Type K Bend 111/4° 75	4
11-9	Type K S-shape Bend 150 x 300	4
11-10	Type K S-shape Bend 100 x 300	2
11-11	Type K S-shape Bend 75 x 300	9
11-12	Type K Tee 150 x 100	1
11-13	Type K Tee 150 x 75	ę
11-14	Type K Collar 150	4
11-15	Type K Collar 100	2
11-16	Type K Collar 75	4
12	Push Ring for Ductile Iron Pipe	
12-1	Push Ring set TN-30W 150	40
12-2	Push Ring set TN-30W 100	20
12-3	Push Ring set TN-30W 75	30
13	Ductile Iron Deformed Pipe	
13-1	Blank Flange 150	2
13-2	Blank Flange 100	
13-3	Blank Flance 75	
14	Flance Packing	,
14-1	Flance Packing 150	15
14-2	Flange Packing 100	15
14-3	Flance Packing 75	5
15	Rolf and Nint SUS304 M16 v 75	200
16	DOILGINU INUL 303304 INLU A 73 Gete Vielva Cose	7007
171	Cott VELOC Case	10
1-0-1	Uate Valve Case INVICIND-12UC-27LU	17
10-7	Bouom Plate A-1	17
1/	Sluice Valve	c
1-/1	WN 50	×
17-2	WN 40	S
17-3	WN 30	5
17-4	WN 25	15
17-5	WN 20	600
18	Polyvinyl Chloride Pipe Joint	
18-1	Tee Type-B 150×150	-
18-2	Tee Type-B 150×100	б
18-3	Tee Tvne-B 150×50	-
18-4	Tee Type-B 100×100	5
18-5	Tee Tyne-B 100×75	4
18-6	Tee Type D 100×50	. "
10-01	Tec Type-B 100~30	<i>-</i> د
10-/	166 Lype-B / 2×20 Doluming Chlonida Dine Loint	t
101	TOLYTING CHOUND THE JOINT	-
10-7	VS Ioint 100 v 75	
200	Polyvinyl Chloride Pine Joint	-
20-1	Tee Tvne-F 150 x 75	-
20-2	Tee Tvne-F 100 x 75	-
21	Ball Lever Tyne Renair Valve 75 x 100	0
22	Fire Hvdrant	10
23	Fire Hvdrant Case	I
23-1	Fire Hvdrant Case H=780	2
23-2	Ductile Iron Iid MR-1G-10L	- 7
24	Polyvinyl Chloride Pipe and Joint	
24-1	Rubber Socket Pipe HI 150 x 5m	ŝ
24-2	Rubber Socket Pipe VP 150 x 5m	115
24-3	Rubber Socket Pipe VP 100 x 5m	225
24-4	Rubber Socket Pipe VP 75 x 5m	40
24-5	Rubber Socket Pipe VP 50 x 5m	30
24-6	Bend 45° HI 150	9
24-7	Bend 221/2° HI 150	9

No	Nome of Hom	Otto
11 12		ζιγ γ
41-10	TS RS40 X 50	0
41-1/	15 KS50 X 40	0
42	Union Joint	
42-1	WJT-GVS Size20	900
42-2	WJT-GVS Size25	30
42-3	WJT-GVS Size30	5
42-4	WJT-GVS Size40	5
42-5	WJT-GVS Size50	16
43	Polyethylene Pipe Socket pipe WPE 75×5M	35
4	Polyethylene Pipe Joint MP-98PV Size75	2
45	Polyethylene Pipe EF Socket Size75	5
46	Polyethylene Pipe Joint MP-98P Size75	5
47	Polyethylene Pipe Tee MP-98TB Size75×75	1
48	Polyethylene Pipe Gate Valve PTC B22 \$75	1
49	Polyethylene Pipe Cap MP-98C Size75	1
50	Polyethylene Pipe Joint	
50-1	MP-98B Size75 x 45°	3
50-2	MP-98B Size75 x 22 1/2°	4
51	EF Saddle with Plug φ75 x φ20	20
52	Polyethylene Pipe Joint TP-30 Minute Faucet Socket Size20	20
53	Polyethylene Pipe Joint TP-30 Socket Size20	10
54	Polyethylene Pipe Joint TP-30 Union Socket Size20	20
55	Polyethylene Pipe Joint TP-30 Socket for PVC Size20	10
56	Polyethylene Pipe Joint TP-30 Union Elbow60° Size20	5
57	Scraper for Polyethylene Pipe PE Scraper75	1
58	Plane for Resin	
58-1	PK-01	1
58-2	PKE01(2pc/Unit)	10
59	Cutter for Polvethylene Pine	
59-1		-
1-65	DEF 150	- 01
2 (î) 19	FF Controller and accessories	01
60-1	Ef controller MSA 2.0	-
1-00	LI VOINUMA MISAZ.V	
2-00- 60-3	Dive WF8420	
6-00	FF Saddle Drilling Machine Tyne-2N	-
65	Ductile Iron Flance	,
62-1	Ductile Iron Flange 150 x 100	2
62-2	Ductile Iron Flange 100 x 75	5
63	Joining Fixture for Polyvinyl Chloride Pipe	1
63-1	Type-100	2
63-2	Twe-150	10
64	Figure Prime and accessories	1
64-1	Enoise num STR-201	2
64-2	Hose @50mm×10m	14
64-3	Hose @50mm×5m	4
64-4	Strainer	2
64-5	Coupling	6
64-6	Hose Band	6
65	Water Meter NKDA20mm with accessories	310
99	Meter Union for Galvanized Steel Pipe WJT-MO Size20	310
67	Expansion Joint for Repairing	
67-1	Expansion Joint for Repairing φ20	20
67-2	Expansion Joint for Repairing φ30	5
67-3	Expansion Joint for Repairing φ40	5
67-4	Expansion Joint for Repairing $\varphi 50$	10
68	Clamp for Repairing	
68-1	C-25ES	5
68-2	C-40ES	ŝ
68-3	C-SUES	о r
1-00	C-SUES	0 9
69	Vater Stopper for Polyvinyl Chloride Pipe VP Stopper 50mm	s s
5		

No.	Name of Item	Otv
27-7	10S Gize 75	ç -
33	Ston Valve Case F Size?	27
33-1	otop V atve Case 1 312623 Ston Valve Case 1 35 v 400	s
22.7	Stor Valve Case 120 x 700 Stor Valve Case 100 x 280	310
2-00	2000 Valve Case 100 X 200	010
34	Check Valve	0
در 2 - 2 - 5	SGP-PB Pipe Joint	
35-1	PQWK NI 925mm	cI -
35-2	PQWK P φ25mm	5
35-3	PQWK L \$20mm	30
35-4	PQWK T φ20mm	10
35-5	PQWK S φ20mm	20
35-6	PQWK L φ25mm	45
35-7	PQWK RT φ25mm x 20mm	10
35-8	PQWK S φ25mm	20
35-9	PQWK L \$30mm	20
35-10	PQWK RT φ30mm x 25mm	5
35-11	PQWK RT φ30mm x 20mm	15
35-12	PQWK S $\phi 30 \mathrm{mm}$	20
35-13	PQWK L φ40mm	20
35-14	PQWK RT φ40mm x 25mm	5
35-15	PQWK RT φ40mm x 20mm	15
35-16	PQWK S φ40mm	15
35-17	PQWK L φ50mm	15
35-18	PQWK RT φ50mm x 30mm	2
35-19	PQWK RT \$50mm x 25mm	5
35-20	PQWK RT \$50mm x 20mm	10
35-21	PQWK S \$50mm	15
36	Sluice Valve Opener	2
37	Polyethylene Pipe Joint	
37-1	IS Size20	45
37-2	IS Size25	20
37-3	1S Size30	5
37-4	IS Size40	ŝ
37-5	11. Size20	36
37-6	11 Size25	10
37-75	11 Size30	4
37-8	11 Sized0	4
38	Dolvethylene Dine Ivint 1VSD Size20	VC
30	Dolverburgene Dine	5
30.1	r orycuryteue r ipc Double I ariar Dina 20 v 120M	ø
1-60	DOUDIE LAYET FIPE ZU X 1 ZUM	0 -
59-2	Double Layer Pipe 25 X 30M	
5-75 100	Double Layer Pripe 30 X 30M	
59-4	Double Layer Pipe 40 X 20M	1
40	Polyvinyl Chloride Pipe	
40-1	VP13	50
40-2	VP20	150
40-2		0
41-	rolyvingi cinorae rije Joint	0001
41-1	15 520 Tre 620	1200
41-7	TS 530	10
41-3	12 240 TE 650	0
41-4	US 200	1200
2-14 2-14	07T CI	1200
41-0	C71 C1 TC 1 30	07
41-7	13 L3 U	10
41-0	13 L40 TC 1 60	10
41-9	0.CT ST	10
41-10	TS T20 TS T20	00 2
41-11	DS 120	n v
41-12	TS T50	n v
01-14	TS DS75 v 20	ر ۲0
41-17	15 N523 X 20 TS DS30 v 30	ς v
41-10	12 NJ X VCCA CI	r

No.	Name of Item	Otv
70	Electromagnetic Flowmeter	
70-1	ETM3070C Size150mm	2
70-2	Exam Result	2
70-3	Connecting Pipes	7
71	Lubricant V-Soap 2kg	10
72	Adhesive for Polyvinyl Chloride Pipe 500G	40
73	Draining Canvas Hose HL-250	-
74	Pulse Data Logger	
74-1	LR5061	S
74-2	LR5091	
74-3	USB Cable	_
74-4	Software	
75	Dust and Water Proof Case AD15-10-8 (Special processed)	5
76	Color Cone	
76-1	700H Model Number8Y0129	30
76-2	Cone Rod $\varphi 34 L=1.5m$ Model Numbers Y1067	30
<i>LL</i>	Lubricant for Ductile Iron Pipes 2kg	10
78	Wheelbarrow	e
79	Torque Wrench	61.
80	Saddle Snap Tap	4
81	Polyvinyi Chloride Pipe Joint VC Joint 130	n c
82	Iron Cover for Electromagnetic Flowmeter Case	n c
60	Double Lover for Electromagnetic Flowmeter Case	n
04 1	Double Uluasonic Flowincier UFF-20 and Small / Large sensor set	-
04-1	Fortable Ultrasonic Flowmeter UFF-20	
64.2		
C-+0	Latge setisor set	
85	SILUOII UICase Coupliant SCB-DB Straight Pina	n
05 1	$201 - 1 D 0 \tan 2 \ln 1$	1
1-00	φ20πm, L-4.0m	1 <u>t</u>
7-00		- ;
0-00	φoumm, L=4.0m	17
85-4	φ40mm、L=4.0m	10
85-5	φ50mm、L=4.0m	5
86	Check Valve F Sise20 3	310
87	Resin Pipe Detector NPL-100 and accessories	
1-/.8	NPL-100	
87-2	Auaptei Evam menit	
88	Lauri Usur Metal Defector F-00M	
80	Resin Pine Water I eakage Detector	-
89-1	Model D305	-
89-2	Conversion Plug Type-B	7
90	Hammer Drill	
90-1	Model HM1812 (200V)	7
90-2	Parts Number A-21319 29×410mm	4
90-3	Parts Number A-21375 28×410mm	9
90-4	Plug WF8430	2
91	Rammer MT-77HRL	1
92	Plate Compactor	
93	Concrete Cutter and accessories	
93-1	Concrete cutter MCD-218CEH	-
93-2	18MW-RAC	3
94	Generator EF5500iSDE	
96	Ductile Iron Detormed Pipe	¢
1-96	Type-K Flanged Socket 10k KF 150	2 0
7-06	1ype-K Flanged Spigot 10k Kr 150	7

No.2-3 Equipment and materials for NRW training yard (JICA procurement)

Site of installation: NRW training yard

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ove	
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ate	

Date of ha	indover:	
No.	Name of Item	Qty
1	Saddle Snap tap	
1-1	Saddle Snap Tap 75×20	5
1-2	Saddle Snap Tap 100×20	20
1-3	Saddle Snap Tap 100×25	10
1-4	Saddle Snap Tap 100×40	2
1-5	Saddle Snap Tap 150×50	2
2	Joint for Polyethylene Pipe	
2-1	Joint for Polyethylene Pipe Socketø20mm	10
2-2	Joint for Polyethylene Pipe Socketø40mm	5
2-3	Joint for Polyethylene Pipe elbow@20mm	10
2-4	Joint for Polyethylene Pipe elbow¢25mm	10
2-5	Joint for Polyethylene Pipe elbow \$40mm	4
2-6	Joint for Polyethylene Pipe $T\phi 20mm \times \phi 20mm$	2
<i>L</i> -2	Joint for Polyethylene Pipe T $\phi 25$ mm× $\phi 25$ mm	2
2-8	Joint for Polyethylene Pipe Tq40mm×q40mm	2
2-9	Joint for Polyethylene Pipe Pipe endφ20mm	5
2-10	Joint for Polyethylene Pipe Pipe endφ25mm	5
2-11	Joint for Polyethylene Pipe GP \$20mm	15
2-12	Joint for Polyethylene Pipe GP\$25mm	5
2-13	Joint for Polyethylene Pipe GP \$40mm	3
2-14	Joint for Polyethylene Pipe GP $\varphi$ 50mm	2
2-15	Joint for Polyethylene Pipe VP \$40mm	3
2-16	Joint for Polyethylene Pipe Tap Socketø20mm	20
2-17	Joint for Polyethylene Pipe Tap Socket@25mm	20
2-18	Joint for Polyethylene Pipe Tap Socket@40mm	2
2-19	Joint for Polyethylene Pipe Tap Socket@50mm	2
3	Snap Tap for Polyethylene Pipe φ100mm×φ20mm	30
4	EF Saddle with plug S2A	10
5	Snap Tap for Polyvinyl Chloride Pipe	
5-1	Snap Tap φ150mm×φ50mm	-
5-2	Snap Tapφ100mm×φ20mm	30
9	Meter Union for Galvanized Steel Pipe	
6-1	Meter Union \$20mm	30
6-2	Meter Union \$25mm	5
7	Union Joint for Steel Pipe	
7-1	Union Joint φ20mm	20
7-7	Union Joint ¢25mm	20
2-7	Union joint 940mm	5
8	Ball Tap ¢25mm	1
6	Generator and accessories	
9-1	Generator EF5500iSDE	1
9-2	Generator Service manual book	1
9-3	Generator Parts catalog book	1
10	Lever Block LB010	2

Qty	No.	
	15-29	Deformed
	16	Repair Valveo
	17	Fire Hydrant
~	17-1	Fire Hvdrant
25	17-2	Fire Hydrant
10	17-3	Fire Hvdrant (
	18	Air Valve
4	18-1	Air Valve ø25r
18	18-2	Air Valve Flan
4	19	Ductile Iron Pipe
4	19-1	Pipe Joint Parts
13	19-2	Pipe Joint Parts
4	19-3	Pipe Joint Parts
4	20	Ductile Iron Pipe S
7	20-1	Special Ring $\phi 1$
2	20-2	Special Ring
2	20-3	Special Ring q7.
2	21	Water Leakage Pro
	22	Water Leakage Re-
	22-1	Water Leakage F
10	22-2	Water Leakage F
4	23	Cap for Tap and Sto
	23-1	Cap for Tap and
	23-2	Cap for Tap and 3
	23-3	Cap for Tap and S
3	23-4	Cap for Tap and S
	24	Gate Valve and Cas
2	24-1	Gate Valve ¢150
2	24-2	Gate Valve ¢1001
2	24-3	Gate Valve @75m
	24-4	Gate Valve Case
4	24-5	Gate Valve Case
. 4	2.2	Lubricant 2ko
. 4	26	Polvethvlene Straig
6	27	Polvethvlene Two-I
10	27-1	Polyethylene Tw
4	27-2	Polyethylene Tw
4	27-3	Polyethylene Tw
6	27-4	Polyethylene Tw
4	28	Bend for Polyethyl
4	28-1	Bend for Polyeth
4	28-2	Bend for Polyeth
4	29	Joint for Polyethyle
e.	29-1	Joint for Polyethy
3	29-2	Joint for Polyethy
	30	Valve for Polyeth
4	31	Polyvinyl Chloride Pi

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15-16

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15-22

4 12

Qty

PVC Pipe Insertion Machine PIM200-R

13-1

13-2

Ductile Iron Straight Pipe

Pipe IS-50AH

12 13

No. = 13-3

14-1 14-2

Ductile Iron Short Pipe

4

14-8

14-7

14-9 14-10

14-4

14-5 14-6

14-3

14-11

Ductile Iron Deformed Pipe Deformed Pipe \$150mm Deformed Pipe \$100mm

15

15-1

15-2 15-3

4

10 25 10 15 40 10

2

2

15-4

15-5 15-6 15-8 15-10 15-11 15-12 15-13 15-14 15-15

15-7

15-9

No.	Name of Item	Qty
35	Cap for Polyvinyl Chloride Pipe	
35-1	Cap for Polyvinyl Chloride Pipe φ20mm	10
35-2	Cap for Polyvinyl Chloride Pipe φ25mm	10
35-3	Cap for Polyvinyl Chloride Pipe @40mm	10
36	Gate Valve for Polyvinyl Chloride Pipe	
36-1	Gate Valve ¢150mm	1
36-2	Gate Valve φ100mm	2
37	Adhesive for Polyvinyl Chloride Pipe 500g	80
38	Lubricants for Polyvinyl Chloride Pipe 2kg	10
39	Polyethylene Powder Lined Steel Pipe	
39-1	φ20mm×L4000mm	10
39-2	φ25mm×L4000mm	5
39-3	φ40mm×L4000mm	5
39-4	φ80mm×L4000mm	2
39-5	φ100mm×L4000mm	4
40	Joint for Polyethylene Powder Lined Steel Pipe	
40-1	Socket $\varphi 20 \mathrm{mm}$	20
40-2	Socket $\phi 25 \text{mm}$	20
40-3	Socket p40mm	10
40-4	Socket $\phi$ 100mm	5
40-5	Elbow ¢20mm	20
40-6	Elbow ¢25mm	20
40-7	Elbow ¢40mm	20
40-8	Elbow ¢80mm	5
40-9	Elbow ¢100mm	10
40-10	$T \phi 20 mm$	20
40-11	$T \phi 25 mm$	20
40-12	$T \ \varphi 40 mm$	5
40-13	$T \phi 100 mm$	2
40-14	Union ¢20mm	5
40-14	Union ¢25mm	5
40-15	Union \$40mm	5
40-16	Nipple ¢20mm	10
40-17	Nipple ¢25mm	10
40-18	Nipple φ40mm	10
40-19	Nipple ¢100mm	10
41	Flange for Polyethylene Powder Lined Steel Pipe	
41-1	Flange (1) $\phi 20 \text{mm}$	4
41-2	Flange (2) $\varphi 25mm$	4
41-3	Flange (3) $\phi$ 40mm	5
414	Flange (4) φ100mm	5
41-5	Flange (1) $\phi75mm$	8
41-6	Flange (2) \u00f6100mm	10
42	Stainless Steel bolt and nut	
42-1	SUS BT.NTp16mm x L75mm	250
42-2	SUS BT.NTp16mm x L80mm	120
42-3	SUS BT.NTφ12mm x L55mm	20

No.	Name of Item	Qty
31-1	Polyvinyl Chloride Straight Pipe (1) $\phi$ 150mm×L5000mm	6
31-2	Polyvinyl Chloride Straight Pipe (2) ¢100mm×L5000mm	15
31-3	Polyvinyl Chloride Pipe (1)	20
31-4	Polyvinyl Chloride Pipe (2) ¢25mm×L4000mm	20
31-5	Polyvinyl Chloride Pipe (3) \$40mm×L4000mm	20
31-6	Polyvinyl Chloride Short Pipe $(1) \phi 150 \text{mm} \times \text{L}300 \text{mm}$	4
31-7	Polyvinyl Chloride Short Pipe $(2) \phi 100 \text{mm} \times L300 \text{mm}$	4
31-8	Polyvinyl Chloride Short Pipe $(3) \phi 150 \text{mm} \times \text{L260mm}$	2
31-9	Polyvinyl Chloride Short Pipe (4) $\phi$ 100mm×L250mm	2
32	Bend for Polyvinyl Chloride Pipe	
32-1	Bend for Polyvinyl Chloride Pipe ¢150mm×90°	2
32-2	Bend for Polyvinyl Chloride Pipe ¢100mm×45°	4
33	Joint for Polyvinyl Chloride Pipe	
33-1	VK-00TF $\varphi$ 150mm× $\varphi$ 100mm	2
33-2	VK-00TF 0100mm×0100mm	1
33-3	VK-00TB @150mm×p100mm	1
33-4	VK-00TB $\phi$ 100mm× $\phi$ 100mm	1
33-5	VK-00VS \$\phi150mm	4
33-6	VK-00VS $\phi$ 100mm	4
33-7	VK-00VS $\phi$ 150mm× $\phi$ 100mm	1
33-8	VK-00VS $\phi$ 100mm× $\phi$ 75mm	1
33-9	VK-00B $\phi$ 150mm×90°	2
33-10	VK-00B $\phi 150 \text{mm} \times 45^{\circ}$	4
33-11	VK-00B $\phi 100 \text{mm} \times 90^{\circ}$	5
33-12	VK-00B $\phi$ 100mm×45°	8
33-13	VK-00B \u00c0100mm×22-1/2°	4
33-14	VP Socket \$\phi20mm	50
33-15	VP Socket \$\overline{\phi}25mm	20
33-16	VP Socket \$\overline{\phi_0}\$ p40mm	20
33-17	VP Elbow \$\phi20mm 20mm	50
33-18	VP Elbow \$\phi25mm\$	20
33-19	VP Elbow \$\overline{\phi_0}40mm	20
33-20	Joint ¢20mm	10
33-21	Joint p30mm	10
33-22	Joint ¢40mm	5
33-23	Joint ¢50mm	5
33-24	MF Joint \$150mm	4
33-25	MF Joint φ100mm	4
33-26	Dresser Joint (1) $\phi$ 150mm	1
33-27	Dresser Joint (2) \u00t8100mm	1
33-28	Dresser Joint (1) \$150mm	5
33-29	Dresser Joint (2) φ100mm	15
33-30	Bag Joint φ100mm	1
34	Repair Clamp	
34-1	Repair Clamp for Plastic Pipe $\phi75\mathrm{mm}$	1
34-2	Repair Clamp for Plastic Pipe φ100mm	1
34-3	Repair Clamp for Plastic Pipe \$150mm	1

No.	Name of Item	Qty
42-4	SUS BT.NTøl6mm x L60mm	20
42-5	SUS BT.NTøl6mm x L65mm	20
43	Flange Packing	
43-1	Flange Packing φ20mm	10
43-2	Flange Packing φ25mm	10
43-3	Flange Packing ¢40mm	10
43-4	Flange Packing φ50mm	5
43-5	Flange Packing φ75mm	10
43-6	Flange Packing ¢100mm	15
43-7	Flange Packing φ150mm	25
43-8	Flange Packing \$100mm 10K	10
44	Level Regulating Valve	
44-1	Level Regulating Valve $\phi 40 \mathrm{mm}$	2
44-2	Level Regulating Valve $\phi 20 \mathrm{mm}$	ю
45	Check Valve	
45-1	Check Valve $\phi 20 \mathrm{mm}$	10
45-2	Check Valve \$25mm	1
45-3	Check Valve \$40mm	-
46	Sluice Valve	
46-1	Sluice Valve φ20mm	20
46-2	Sluice Valve ¢25mm	10
47	Stop Valve	
47-1	Stop Valve \$40mm	3
47-2	Stop Valve φ50mm	2
47-3	Stop Valve Box L125mm×W400mm	5
48	Pipe Drilling Machine	
48-1	Pipe Drilling Machine 2N	ю
48-2	Pipe Drilling Machine S2A	-
48-3	Pipe Drilling Machine ¢20mm	2
49	Engine Cutter and Accessories	
49-1	Engine Cutter EK7650H	1
49-2	Engine Cutter A-36382 Cutlery	1
49-3	Engine Cutter A-36631 Cutlery	2
49-4	Engine Cutter 195599-9 filter	1
49-5	Engine Cutter 225094-6 V belt	3
50	Electromagnetic Flow Meter an Accessories	
50-1	Electromagnetic Flow Meter Set MagneW3000 FLEX	1
50-2	Electromagnetic Flow Meter Set Fastening set	1
50-3	Electromagnetic Flow Meter Set LR5061 Pulse logger	1
50-4	Electromagnetic Flow Meter Set LR5091 Communication adapter	1
51	Pump	
51-1	Pump T-100K	2
51-2	Pump PP-201T	1
52	Bulb Opener No.1721	2
53	Tamper No.5231	2
54	Torque Wrench RM-30LYNT	1
55	Chain Pipe Wrench TW150N	2

No.	Name of Item	Qty
56	Wrench	
56-1	Pipe Wrench PW-SD30	5
56-2	Pipe Wrench PW-SD60	5
56-3	Adjustable Angle Wrench H-300	5
56-4	Adjustable Angle Wrench H-450	5
56-5	Adjustable Angle Wrench H-600	5
56-6	Ratchet Wrench RWH-0924	5
56-7	Ratchet Wrench RWH-0930	5
57	Pipe Electrofusion Unit	
57-1	Pipe Electrofusion Unit MSA2.1	1
57-2	Pipe Electrofusion Unit WF8430	1
58	Pipe Cutter	
58-1	Pipe Cutter PEI-75	1
58-2	Pipe Cutter PEE75	1
58-3	Pipe Cutter PE-100	2
58-4	Pipe Cutter PEE 150	2
58-5	Pipe Cutter PEI-50	5
58-6	Pipe Cutter PEE75	5
59	Water Pressure Gauge EA729GM-20	5
60	Water Meter and Accessories	
60-1	Water Meter NKDA20	4
60-2	Water Meter NFDW100	2
60-3	Water Meter Storage Case MB20SB	5

### (2) Handover document

## Handover document: Attachment 2

No.	Number and name of equipment procurement	Procurement by	Handover document
	Equipment related to NRW management (Excavator)	JICA Office	Yes
2	Equipment and materials for NRW management	JICA	None
б	Equipment and materials fir NRW training	JICA	None

#### III. Output 3

### (1) Equipment list

No.3-1 Equipment for water quality management (Part 1)

Site of installation: WRAWSA Central laboratory, Mini laboratory and Nyaunghnapin WTP 2016 5

Dec. 2	
indover: 27	
Date of h	No.

No.	Item	Qty
1	Benchtop turbidity meter	-
2	Portable turbidity meter	5
3	Color of water portable photometer	9
4	Portable pH meter	5
5	Pocket Colorimeter 2, Chlorine model	1
9	Hot plate stirrer	1
7	Magnetic stirrer	4
8	Stirring bar	15
6	Burette stand	2
10	Grass ware	1
11	Jar tester	1
12	Sieve shaker	-
13	Test sieves	2
14	Electric balance	1
15	Interface level monitor	1
16	Desiccator	1
17	Vacuum fülter holder	3
18	Bell jar	2
19	Vacuum pump	1
20	Evaporation dish	30
21	Filter paper, 47mm dia.	2
22	Gas detector*	1
*No.22 G	as detector: Equipment accompanied with dispatch	

Ļ ndmh

No.3-2 Equipment for water quality management (Part 2)

Site of installation: Nyaunghnapin WTP

Date of handover: 28 Mar. 2018

Qty	1	1
Item	Desiccator	Drying oven
No.	1	2

No.3-3 Equipment for water quality management (Part 3)

Site of installation: Nyaunghnapin WTP Date of handover: 28 Mar. 2018

No.	Item	Qty
1	Portable flow meter UF801P	2
2	Extension cable 95m	2
3	Prove and support set SE1595	2

No.3-4 Standard, guideline and reference book

Site of installation: HRD section of WRAWSA

Date of handover: 9 Feb. 2017

Qty	1	1	1	1	1	1	
Item	Standard methods for the examination of water and wastewater	WHO Guidelines for drinking-water quality, 4th edition	Water quality data analysis and interpretation	Integrated design and operation of water treatment facilities, 2nd edition	MWH's water treatment principles and design, 3rd edition	Water quality & treatment: A handbook on drinking water, $6^{th}$ edition	
No.	1	2	3	4	5	9	

No.3-5 Manuals and reference books (Long term expert procurement)

Site of installation: HRD section of WRAWSA

Date of handover: 11 Sep. 2017

No.	Item	Qty
1	Standard Methods for the Examination of Water and Wastewater, 22nd Edition	1
2	Guidelines for drinking-water quality, 4 <sup>th</sup> edition	1
ю	Water quality data analysis and interpretation	1
4	Integrated Design and Operation of Water Treatment Facilities, 2 <sup>nd</sup> Edition	1
5	MWH's Water Treatment Principles and Design, 3 <sup>rd</sup> Edition	1
9	Water Quality & Treatment: A Handbook on Drinking Water, 6 <sup>th</sup> Edition	1
7	AWWA Manual Series, and books	
7-1	M1 Principles of Water Rates, Fees, and Charges, sixth edition (30001-6E)	1
7-2	M3 Safety Management for Utilities, seventh edition (30003-7E)	1
7-3	M29 Fundamentals of Water Utility Capital Financing, fourth edition (30029-4E)	1
7-4	M47 Capital Project Delivery, second edition (30047)	1
7-5	M7 Problem Organisms in Water: Identification & Treatment, third edition (30007)	1
7-6	M12 Simplified Procedures for Water Examination, sixth edition (30012-6E)	1
7-T	M20 Water Chlorination & Chloramination Practices & Principles, second edition	1
	M37 Oberational Control of Coagulation and Filtration Processes. third edition	
7-8	(30037)	-
7-9	M48 Waterborne Pathogens, second edition (30048)	1
7-10	M57 Algae: Source to Treatment (30057)	1
7-11	M65 On-site Generation of Hypochlorite (30065)	1
7-12	M2 Instrumentation & Control, third edition (30002)	-

No.	ltem	Qty
7-13	M6 Water Meters: Selection, Installation, Testing & Maintenance, fifth edition (30006-5E)	-
7-14	M11 Steel Pipe: A Guide for Design and Installation, fourth edition (30011)	1
7-15	M22 Sizing Water Service Lines and Meters, third edition (30022-3E)	1
7-16	M23 PVC Pipe Design and Installation, second edition (30023)	1
7-17	M28 Rehabilitation of Water Mains, third edition (30028-3E)	1
7-18	M32 Computer Modeling of Water Distribution Systems, third edition (30032-3E)	1
7-19	M33 Flowmeters in Water Supply, second edition (30033)	1
7-20	M36 Water Audits and Loss Control Programs, 4th edition (30036-4E)	1
7-21	M41 Ductile-Iron Pipe and Fittings, third edition (30041)	1
7-22	M44 Distribution Valves: Selection, Installation, Field Testing & Maintenance,	1
	third edition (30044-3E)	
7-23	M49 Butterfly Valves: Torque, Head loss and Cavitation Analysis, second edition (30029-2E)	-
7-24	M51 Air-Release, Air/ Vacuum & Combination Air Valves (30051)	1
7-25	M55 PE Pipe Design and Installation (30055)	-
7-26	M21 Groundwater, fourth edition (30021-4E)	1
7-27	M50 Water Resources Planning, second edition (30050)	-
7-28	M52 Water Conservation Programs: A Planning Manual (30052)	1
7-30	Benchmarking Water Services (20723)	1
7-31	Utility Management for Water and Wastewater Operators (20721)	1
7-32	Focus First on Service: The Voice and Face of Your Utility (20629)	1
7-33	Communications and Customer Relations (47420)	1
7-34	Communicating Water's Value: Talking Points, Tips & Strategies (20757)	1
7 25	Financial Management for Water Utilities: Principles of Finance, Accounting, and	-
00-1	Management Controls, Softcover edition (20743-PE)	-
7-36	Cost Estimating Manual for Water Treatment Facilities	1
7-37	Water Treatment Plant Design, Fifth Edition, AWWA	1
8	AWWA WSO (Water Supply Operation) Textbook and Workbook	
8-1	WSO: Water Sources, Fourth Edition	1
8-2	WSO: Water Treatment, Fourth Edition	1
8-3	WSO: Water Transmission and Distribution, Fourth Edition	1
84	WSO: Water Quality, Fourth Edition	1
8-5	WSO: Basic Science Concepts and Applications, Fourth Edition	1
8-6	WSO: Water Treatment Student Workbook, Fourth Edition	1
8-7	WSO: Water Transmission and Distribution Student Workbook, Fourth Edition	1
8-9	WSO: Water Quality Student Workbook, Fourth Edition	1
8-10	WSO: Basic Science Concepts and Applications Student Workbook, Fourth Edition	1
6	Strategy and Human Resource Management -Management, Work and Organizations-	1
	(4th Edition)	
10	Essentials of Organizational Behavior (13th Edition)	1
11	Performance Indicators for Water Supply Services: Third Edition (Hardback)	1
1	Institutional Governance and Regulation of Water Services: Second Edition	-
2	(Paperback)	
13	GIS Tutorial 1 Basic Workbook, 10.3.x edition	-
14	GIS Tutorial 2 Spatial Analysis Workbook (for 10.3.x edition)	-
15	Principles of Water Treatment	1

### (2) Handover document

Handover document: Attachment 3

No	Mindow and mana of continuous we consomet	Procurement	Handover
.0NI		by	document
3-1	Equipment for water quality management (Part 1)	Consultant	Yes
3-2	Equipment for water quality management (Part 2)	Consultant	Yes
3-3	Equipment for water quality management (Part 3)	Consultant	Yes
3-4	Standard, guideline and reference book	Consultant	Yes
3-5	Manuals and reference hooks	Long term	Ves
r C		expert	201

CERTIFICATE OF HANDOVER		PROJECT TITLE: * THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"	This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>24<sup>th</sup> August, 2016</u> to <u>Yangon City Development</u> <u>Committee (YCDC), Engineering Department (Water and Sanitation)</u> .	Attached is the certificate of completion of all equipment.	位藏 建孝	Mir. Hirotaka SALO Chief Adviser The Project for Improvement of Water Supply Management of YCDC	24 <sup>th</sup> August, 2016	
Attachment 1 Handover document: Output 1	No.1-1 Equipment for local offices for collection of electric data and calculation of PIs (Part 1)							

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No.1-2 Equipment for local offices for collection of electric data and calculation of PIs (Part 2)

and distribution sheet for PI

Inspection

List of Equipment

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Quantity

Remarks

S.No. Equipment Name

Including: MS-office Windows, professional software (Genuine)

Anti-Virus software (Genuine)
Printer (leaser, black & white, A4) for local stations
Resolution - 600 x 600 dpi
Papre size - A4, B5, A5, etc.
Black & White

0

MS-office Windows, professional software (Genuine)

Including:

Personal computer (desktop) and UPS Anti-Virus software (Genuine)

Personal computer (laptop)

2

# CERTIFICATE OF HANDOVER

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the books in the attached list for above-mentioned project have been handed over properly as of *February 20<sup>th</sup>*, 2017 to *Yangon City Development Committee (YCDC)*.

(Signature) JA TA JA JA

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

February 20th, 2017

# CERTIFICATE OF RECEIPT

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that PC equipment listed below for above-mentioned project have been received properly as of *February 20<sup>th</sup>, 2017* to <u>Yangon City Development</u> <u>Committee (YCDC)</u> from Japan International Cooperation Agency (JICA) Myanmar Office

- Procurement Items : Personal computer (desktop) and UPS
  - Personal computer (laptop)
- Printer (leaser, black & white, A4)
- > Date of Handover : February 20th, 2017

(Signature)

Mr. Myint Oo Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC February 20th, 2017

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botaintaung Township, Yangon.

No.1-3 Manuals and reference books (PC related) (Long term expert procurement)

CERTIFICATE OF HANDOVER

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the books in the attached list for above-mentioned project have been handed over properly as of *February 9th*. 2017 to Yangon City Development Committee (YCDC).

(signature) 万 成 うんな

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

February 9th, 2017

# List of Equipment (Book)

No.	Name of Items	Oty.	Place of Delivery	Date of Handove
-	Microsoft Office Word 2016	60 copies	No. 390, YCDC Office Building	2017.2.5
2	Microsoft Office Excel 2016	60 copies	No. 390, YCDC Office Building	2017.2.9
m	Microsoft Office PowerPoint 2016	60 copies	No. 390, YCDC Office Building	2017.2.9
4	Using Window 8	60 copies	No. 390, YCDC Office Building	2017.2.9

No.1-4 GIS software

# CERTIFICATE OF RECEIPT

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the books listed below for above-mentioned project have been received properly as of *February 9<sup>th</sup>*, 2017 to *Yangon City Development Committee* (*YCDC*) from Japan International Cooperation Agency (JICA) Myanmar Office

- Name of the Book : Microsoft Office Word 2016 Microsoft Office Excel 2016 Microsoft Office PowerPoint 2016
- General Description of the Book : Computer tutorial books for Windows, Ward, Excel and PowerPoint

Using Window 8

> Date of Handover : February 9<sup>th</sup>, 2017



Mr. Myint Oo Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC February 9th, 2017

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon. List of Equipment

1.1.1

Quantity

Basic 10.5 Single Use

Remarks

S.No. Equipment Name 1 ArcGIS Software

# **CERTIFICATE OF HANDOVER**

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the software in the attached list for above-mentioned project have been handed over properly as of *February 23th*, 2017 to Yangon City Development Committee (YCDC).

(Signature) な 市 34 3

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

February 23th, 2017

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# **CERTIFICATE OF RECEIPT**

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PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that software listed below for above-mentioned project have been received properly as of *February 23<sup>th</sup>*. 2017 to <u>Yangon City Development Committee</u> (<u>YCDC</u>) from Japan International Cooperation Agency (JICA) Myanmar Office

Procurement Items : - ArcGIS Software Basic 10.5 Single Use

> Date of Handover : February 23th, 2017

(Signature)

Mr. Myint Oo Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC February 23th, 2017

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon.

No.1-5 Auto CAD software

**CERTIFICATE OF HANDOVER** 

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PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the software in the attached list for above-mentioned project have been handed over properly as of <u>March 21<sup>st</sup>, 2017</u> to <u>Yangon City Development</u> Committee (YCDC).

(Signature) 九 成 沙小3

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

March 21st, 2017

### List of Equipment

		Remarks	Quantity
1 Auto Cad 20	017 LT	2D Support E License	2

# **CERTIFICATE OF RECEIPT**

FL (4)

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that software listed below for above-mentioned project have been received properly as of <u>March 21<sup>st</sup>, 2017</u> to <u>Yangon City Development Committee</u> (<u>YCDC</u>) from Japan International Cooperation Agency (JICA) Myanmar Office

Procurement Items : - Auto Cad 2017 LT (2D Support E License)

> Date of Handover : March 21st, 2017

(Signature)

Mr. Myint Oo Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC March 21st, 2017

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon.

No.1-6 Flow monitoring system (JICA procurement)



TECI 守田康彦

確認日:2018年8月23日

添付資料:YCDC-EDWSのInvoice

#### 保管状況概要

- 超音波流量計一式は YCDC 新庁舎脇の関連施設(通称、AID Complex)で室内保管されている。 保管室の状況を以下に示す。
  - 外観検査を行った。合計23 箱が保管されており、いずれの箱も破損は無かった。
    - 保管室は常時施錠されており、鍵は YGDC 職員が管理している。



AID Complex にて保管されている機材リストを以下に示す。 (ただし、箱面ラベルの確認のみ)









巧真			6252-65
内容品名称	Ultrasonic flow meter UFL30 + coax. Cable 170m	Ultrasonic flow meter UFL30 + coax. Cable 40m	Ultrasonic flow meter UFL30 + coax. Cable 140m 連番 53-2579 から、No.12 と推定
箱番号	10	Ξ	12
中			
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内容品名称	Ulfrasonic flow meter UFL30 + coax. Cable 150m	Ultrasonic flow meter UFL30 + coax. Cable 150m	Ulfrasonic flow meter UFL30 + coax. Cable 110m
箱番号	19	20	21



	1	· Code A · State A · StateA ·
写真	Alter of a local state of the s	Index         Index <th< th=""></th<>
内容品名称	Coax. Cable 300m	Coax. Gable 220m
箱番号	22	23

<mark>添付資料</mark> YCDC-EDWS の Invoice(次ページ)

- YCDC-EDWS より AID Complex に対し、超音波流量計一式の保管を委託するための書類
   署名者(左より):EDWS チーフエンジニア、Mr. Zaw Oo(本件機材に関する YCDC 側担当者)、 AID Complex責任者

5 - 27

2 ..

တိုက်လက် ကိုလ်ကို (လျှင်္သာ) နေတာက်စားညက်ကို (လျှင်္သာ) ကိုလ်ကားကိုက်နက်နက် (လျှင်္သာ) ကိုလ်ကားကိုက်နက်နက် (လျှင်္သာ) ကိုလ်ကားကျော် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျော် ကိုလ်ကားကျောင် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျောင် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျော် ကိုလ်ကားကျောင် ကိုလ်ကားကျော် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလ်ကားကျောင် ကိုလာကားကျော် ကိုလာကားကျော် ကိုလာကားကျော် ကိုလာကားကျော် ကိုလာကာကားကားကျောင် ကိုလာက	ရန်ကုန်မြို့တော်စည်ပင်သာယာရေးကော် အင်ဂျင်နီယာဌာန (ရေနှင့်သန့်ရှင်းမှု ထုန် <u>ပိ</u> ံလူသ	ကုန်( လက်	848 	3886		<u></u> 224	- 33 and 33 and -	က်က်က်က် အတွက် က	Cable 300m & a	Cable 220m de o								စီခံသူ ေရးမူသူ က ဂ်ိဳ
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	ကာဒ်မထိ ် ဂုဒ်းမှု)	႒ုနိပိုလူသအမှတ် သင်္ဂခံသည်ရက်နွဲ <u>သမိုး မ်ား ၁၁၅ .</u>					နူနိုး သင့်နွေ	තුරි ලිං: තුරි ලං:								3		10xco

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# Attachment 2 Handover document: Output 2

No.2-1 Equipment related to NRW management (Excavator)

# CERTIFICATE OF HANDOVER

PROJECT TITLE: " THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>September 20<sup>th</sup>, 2016</u> to <u>Yangon City</u> <u>Development Committee (YCDC) and to request YCDC to implement Undertakings</u>

attached.

Mr. Atsuo ONO Deputy Chief Advisor JICA Expert Team

(signature) 大野 款 主

September 20<sup>th</sup>, 2016

Date of Handover	2016.9.20
Place of Delivery	Yegu Pumping Station, Yesal street, Word(9), Mayangone Township, Yangon, Myanmar
Qty.	÷
Name of Item	Back Hoe
No.	-

### Undertakings by YCDC

- To inform JICA Expert Team of responsible person of the equipment
- To secure space for park the equipment and take security measures
- To prepare own operation and maintenance manuals based on the manuals provided by the manufacture
- To implement regular maintenance according to the manuals
- To bear necessary operational expenses such as spare parts, fuel, etc.
- To use the equipment for project activities such as NRW management and flow meter monitoring system as the first priority

(様式14)②

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the equipment listed below for above-mentioned project have been received properly as of <u>September 20<sup>th</sup>, 2016</u> to <u>Yangon City Development</u> <u>Committee (YCDC)</u> from Japan International Cooperation Agency (JICA) Myanmar Office and to pledge that we implement the undertakings as stipulated in the document of Certificate of Handover.

- > Name of the Facility : Back Hoe
- > General Description of the Equipment :

Horse power: more than 27 HP Bucket: more than 0.10 m<sup>3</sup> Maximum Digging Depth: more than 3.000 mm Overall width: between 1.500mm and 1.800 mm Warranty: maintenance service more than 1 year, or more than 1,000 hours Date of Handover : September 20<sup>th</sup>, 2016

(signature) Mr. Myint Oo Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC

September 20th, 2016

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon,

No.2-2 Equipment and materials for NRW management

# Attachment 3 Handover document: Output 3

No.3-1 Equipment for water quality management (Part 1)

No.2-3 Equipment and materials fir NRW training

List of Equipment

No.	Name of Items	Qty.	Place of Delivery	Date of Handover
1-1	Bench Top Turbidity Meter	1 set	YCDC AID Complex	2016.12.27
1-2	Portable Turbidity Meter	5 sets	YCDC AID Complex	2016.12.27
1-3	Color of Water Portable Photometer	6 sets	YCDC AID Complex	2016.12.27
1-4	Portable pH Meter	5 sets	YCDC AID Complex	2016.12.27
1-5	Pocket Colorimeter II, Chlorine Model	1 set	YCDC AID Complex	2016.12.27
<b>1-6</b>	Hot Plate Stirrer	1 set	YCDC AID Complex	2016.12.27
1-7	Magnetic Stirrer	4 sets	YCDC AID Complex	2016.12.27
1-8	Stirring Bar	15 pcs.	YCDC AID Complex	2016.12.27
1-9	Burette Stand	2 sets	YCDC AID Complex	2016.12.27
-10	Set of glassware	1 set	YCDC AID Complex	2016.12.27
2-1	Jar Tester	1 set	YCDC AID Complex	2016.12.27
2.2	Sieve Shaker	1 set	YCDC AID Complex	2016.12.27
5-3	Test Sieves	2 sets	YCDC AID Complex	2016.12.27
5-4	Electronic Balance	1 set	YCDC AID Complex	2016.12.27
5-2	Interface Level Monitor	1 set	YCDC AID Complex	2016.12.27
17	Desiccator	1 set	YCDC AID Complex	2016.12.27
25	Vacuum Filter Holder	3 sets	YCDC AID Complex	2016.12.27
2.3	Bell Jar	2 sets	YCDC AID Complex	2016.12.27
4	Vacuum Pump	1 set	YCDC AID Complex	2016.12.27
5-2	Evaporation Dish	30 pcs.	YCDC AID Complex	2016.12.27
9	Filter Paper, 47mm dia.	2 boxes	VCDC AID Complex	TC C1 3100

CERTIFICATE OF HANDOVER

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>December 27<sup>th</sup></u>, 2016 to <u>Yangon City</u> <u>Development Committee (YCDC)</u>.

(signature) 打 疏 34茨

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

December 27th, 2016

## CERTIFICATE OF RECEIPT

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the equipment listed below for above-mentioned project have been received properly as of <u>December 27<sup>th</sup></u>, <u>2016</u> to <u>Yangon City Development</u> <u>Committee (YCDC)</u> from Japan International Cooperation Agency (JICA) Myanmar Office

- > Name of the Equipment : <u>Water quality monitoring equipment. Jar tester. Sieving</u> test equipment and Interface level monitor
- > General Description of the Equipment : <u>Water quality monitoring and water quality</u> improvement equipment
- > Date of Handover : December 27th, 2016

(signature)

Mr. Myint Oo Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC December 27th, 2016

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon.

No.3-2 Equipment for water quality management (Part 2)

# CERTIFICATE OF HANDOVER

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>March 28<sup>th</sup>, 2018</u> to <u>Yangon City Development</u> <u>Committee (YCDC)</u>.

JICA Technical Cooperation Project Team (signature) If M R. R. Mr. Hirotaka SATO Chief Advisor Jor

March 28<sup>th</sup>, 2018

### List of Equipment

M.	Manua of Banne	40	Place of	Date of
	STILLE OF FEELS	-cuy.	Delivery	Handover
-	Desiccator	1 set	VCDC AID Complex	2018.3.28
m	Drying oven	1 set	YCDC AID Complex	2018.3.28

## CERTIFICATE OF RECEIPT

No.3-3 Equipment for water quality management (Part 3)

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>March 28<sup>th</sup>, 2018</u> to <u>Yangon City Development</u> Committee (YCDC).

- > Name of the Equipment : Desiccator and Drying oven
- > General Description of the Equipment : Experimental equipment for water treatment process improvement
- > Date of Handover : March 28th, 2018



Mr. Aung San Win Chief Engineer Head of Department of Engineering (Water and Sanitation), YCDC Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon.

March 28<sup>th</sup>, 2018

List of Equipment

2018.3.28 2018.3.28 2018.3.28

YCDC AID Complex VCDC AID Complex YCDC AID Complex

Probe and support set SE1595

m 2

2 sets 2 sets

2 sets Oty.

Portable flow meter UF801P

Extension cable 95m

Name of Items

No. , I

Handover Date of

Place of Delivery

# **CERTIFICATE OF HANDOVER**

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of March 28th, 2018 to Yangon City Development Committee (YCDC).

(signature) FIA A. 3, Mr. Hirotaka SATO Jur -

JICA Technical Cooperation Project Team Chief Advisor

March 28<sup>th</sup>, 2018

## CERTIFICATE OF RECEIPT

No.3-4 Standard, guideline and reference book

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>March 28<sup>th</sup>, 2018</u> to <u>Yangon City Development</u> <u>Committee (YCDC)</u>.

- > Name of the Equipment : Portable flow meter
- > General Description of the Equipment : <u>Ultrasonic flow meter for water</u> treatment process improvement
- Date of Handover : March 28<sup>th</sup>, 2018



Mr. Aung San Win Chief Engineer Head of Department of Engineering (Water and Sanitation), YCDC Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon.

March 28<sup>th</sup>, 2018

List of Equipment (Book)

No.	Name of Items	Oty.	Place of Delivery	Date of Handove
H	Standard Methods for the Examination of Water and Wastewater, 22 <sup>nd</sup> Edition	1 copy	No. 390, YCDC Office Building	2017.2.9
2	Guidelines for drinking-water quality, 4 <sup>th</sup> edition	1 copy	No. 390, YCDC Office Building	2017.2.9
m	Water quality data analysis and interpretation	1 copy	No. 390, YCDC Office Building	2017.2.9
4	Integrated Design and Operation of Water Treatment Facilities, 2 <sup>nd</sup> Edition	1 copy	No. 390, YCDC Office Building	2017.2.9
S	MWH's Water Treatment Principles and Design, 3 <sup>rd</sup> Edition	1 copy	No. 390, YCDC Office Building	2017.2.9
9	Water Quality & Treatment: A Handbook on Drinking Water, 6 <sup>th</sup> Edition	1 copy	No. 390, YCDC Office Building	2017.2.9

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY

MANAGEMENT OF YCDC"

**CERTIFICATE OF HANDOVER** 

This is to certify that the books in the attached list for above-mentioned project have been handed over property as of *February 9<sup>th</sup>*. 2017 to Yangon City Development

Committee (YCDC).

(signature) 弘 成了七子

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

February 9th, 2017

## CERTIFICATE OF RECEIPT

No.3-5 Manuals and reference book

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC" This is to certify that the books listed below for above-mentioned project have been received properly as of *February 9th*. 2017 to Yangon City Development Committee (YCDC) from Japan International Cooperation Agency (JICA) Myanmar Office

- > Name of the Book : Standard Methods for the Examination of Water and
  - Wastewater, 22<sup>14</sup> Edition - Guidelines for drinking-water quality, 4<sup>th</sup> edition
    - Water quality data analysis and interpretation
- MWIt's Water Treatment Principles and Design, 3<sup>rd</sup> Edition
- Water Quality & Treatment: A Handbook on Drinking Water, 6<sup>di</sup>
  - weet Quarty & Irealment: A Handbook on Drinking Water, 6 Edition

> General Description of the Book : Tutorial books Water quality monitoring and water treatment

> Date of Handover : February 9th 2017



Chief Engineer Chief Engineer Head of Engineering Department (Water and Sanitation), YCDC February 9th, 2017

Yangon City Development Committee (YCDC) Office Building, Marchant Rd., Botahtaung Township, Yangon.

### List of books

			Delivere	ed on 22	2/03/2017
	Title	Publisher	ISBN	Сору	Price (JPY)
1. AV	WA Manual Series, and books		•		
1	M1 Principles of Water Rates, Fees, and Charges, sixth edition (30001-6E)	AWWA	9781613001370	1	17,930
2	M3 Safety Management for Utilities, seventh edition (30003-7E)	AWWA	9781583219997	1	13,860
3	M29 Fundamentals of Water Utility Capital Financing, fourth edition (30029-4E)	AWWA	9781625760166	1	12,540
4	M47 Capital Project Delivery, second edition (30047)	AWWA	9781583217566	1	14,300
5	M7 Problem Organisms in Water: Identification & Treatment, third edition (30007)	AWWA	9781583212929	1	15,510
6	M12 Simplified Procedures for Water Examination, sixth edition (30012-6E)	AWWA	9781583219973	1	15,510
7	M20 Water Chlorination & Chloramination Practices & Principles, second edition (30020)	AWWA	9781583214084	1	14,300
8	M37 Operational Control of Coagulation and Filtration Processes, third edition (30037)	AWWA	9781583218013	1	12,870
9	M48 Waterborne Pathogens, second edition (30048)	AWWA	9781583214039	1	17,600
10	M57 Algae: Source to Treatment (30057)	AWWA	9781583217870	1	31,020
11	M65 On-site Generation of Hypochlorite (30065)	AWWA	9781625760265	1	15,510
12	M2 Instrumentation & Control, third edition (30002)	AWWA	9781583211250	1	1,584
13	M6 Water Meters: Selection, Installation, Testing & Maintenance, fifth edition (30006-5E)	AWWA	9781583218624	1	14,300
14	M11 Steel Pipe: A Guide for Design and Installation, fourth edition (30011)	AWWA	9781583212745	1	15,510
15	M22 Sizing Water Service Lines and Meters, third edition (30022-3E)	AWWA	9781625760272	1	12,540
16	M23 PVC Pipe Design and Installation, second edition (30023)	AWWA	9781583211717	1	15,510
17	M28 Rehabilitation of Water Mains, third edition (30028-3E)	AWWA	9781583219706	1	11,770
18	M32 Computer Modeling of Water Distribution Systems, third edition (30032-3E)	AWWA	9781583218648	1	14,300
19	M33 Flowmeters in Water Supply, second edition (30033)	AWWA	9781583214527	1	11,770
20	M36 Water Audits and Loss Control Programs, 4th edition (30036-4E)	AWWA	9781625761002	1	16,500
	Page 1 of 3	-	•		

CERTIFICATE OF HANDOVER

1

PROJECT TITLE: "THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC"

This is to certify that the equipment in the attached list for above-mentioned project have been handed over properly as of <u>11<sup>th</sup> September 2017</u> to <u>Yangon City</u> <u>Development Committee (YCDC)</u>.

(Signature)

Mr. Hirotaka SATO Chief Advisor JICA Technical Cooperation Project Team

11<sup>th</sup> September 2017

	Title	Publisher	ISBN	Сору	Price (JPY)
41	WSO: Water Quality, Fourth Edition	AWWA	9781583217801	1	16,761
42	WSO: Basic Science Concepts and Applications, Fourth Edition	AWWA	9781583217788	1	25,826
43	WSO: Water Treatment Student Workbook, Fourth Edition	AWWA	9781583217948	1	25,141
44	WSO: Water Transmission and Distribution Student Workbook, Fourth Edition	AWWA	9781583218006	1	11,459
45	WSO: Water Quality Student Workbook, Fourth Edition	AWWA	9781583217986	1	10,766
46	WSO: Basic Science Concepts and Applications Student Workbook, Fourth Edition	AWWA	9781583217993	1	12,998
3. Ot	hers				
47	Strategy and Human Resource Management -Management, Work and Organisations- (4th Edition)	Palgrave MacMillan	9781137407634	1	7,217
49	Essentials of Organizational Behavior (13th Edition)	Pearson	9780133920819	1	21,856
50	Performance Indicators for Water Supply Services: Third Edition (Hardback )	IWA Publishing	9781780406329	1	20,930
51	Institutional Governance and Regulation of Water Services: Second Edition (Paperback)	IWA Publishing	9781780404509	1	11,570
52	GIS Tutorial 1 Basic Workbook, 10.3.x edition	Esri Press	9781589484566	1	8,159
53	GIS Tutorial 2 Spatial Analysis Workbook (for 10.3.x edition)	Esri Press	9781589484535	1	8,159
57	Principles of Water Treatment	John Wiley & Sons	9780470405383	1	13,316
	Total: 52 books			52	¥737,927

### Requested but not available

35	Water Utility Accounting: Third Edition	AWWA	ASIN: B01A0BYZBI	1	N/A
48	Foundations of Human Resource Development (2nd Edition)	ReadHowYou Want	9781459609259	1	7,475
54	Red Book MDB (Pink Book) 2010, Conditions of Contract for Construction For Building and Engineering Works Designed by The Employer	FIDIC	2-88432-023-7	1	8,510
55	Yellow book, 1999, Conditions of Contract for Plant and Design Build for Electrical and Mechanical Plant, and For Building and Engineering Works, Designed by the Contractor	FIDIC	2-88432-021-0	1	12,200
56	Silver Book, 1999, Conditions of Contract for EPC/Turnkey Projects First Edition	FIDIC	2-88432-044-X	1	12,200

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	Title	Publisher	ISBN	Сору	Price (JPY)
21	M41 Ductile-Iron Pipe and Fittings, third edition (30041)	AWWA	9781583216323	1	1,584
22	M44 Distribution Valves: Selection, Installation, Field Testing & Maintenance, third edition (30044-3E)	AWWA	9781625760821	1	11,770
23	M49 Butterfly Valves: Torque, Headloss and Cavitation Analysis, second edition (30029-2E)	AWWA	9781583218792	1	11,770
24	M51 Air-Release, Air/ Vacuum & Combination Air Valves (30051)	AWWA	9781583211526	1	9,680
25	M55 PE Pipe Design and Installation (30055)	AWWA	9781583213872	1	14,300
26	M21 Groundwater, fourth edition (30021-4E)	AWWA	9781583219645	1	15,510
27	M50 Water Resources Planning, second edition (30050)	AWWA	9781583214718	1	17,600
28	M52 Water Conservation Programs: A Planning Manual (30052)	AWWA	9781583213919	1	14,300
29	Benchmarking Water Services (20723)	AWWA	9781843391982	1	19,250
30	Utility Management for Water and Wastewater Operators (20721)	AWWA	9781583218235	1	17,600
31	Focus First on Service: The Voice and Face of Your Utility (20629)	AWWA	9781583214589	1	9,900
32	Communications and Customer Relations (47420)	AWWA	N/A	1	10,450
33	Communicating Water's Value: Talking Points, Tips & Strategies (20757)	AWWA	9781583219799	1	9,020
34	Financial Management for Water Utilities: Principles of Finance, Accounting, and Management Controls, Softcover edition (20743-PE)	AWWA	9781625761101	1	14,190
36	Cost Estimating Manual for Water Treatment Facilities	AWWA	978047172997	1	14,300
37	Water Treatment Plant Design, Fifth Edition, AWWA	McGraw-Hill	9780071745727	1	16,079
2. AV	WA WSO (Water Supply Operation) Textbook and Workbook	•	•		
38	WSO: Water Sources, Fourth Edition	AWWA	9781583217825	1	9,407
39	WSO: Water Treatment, Fourth Edition	AWWA	9781583217771	1	9,407
40	WSO: Water Transmission and Distribution, Fourth Edition	AWWA	9781583217818	1	22,918

資料-6: 合同調整委員会議事録等

  Attachment: Main points of discussions	1. Modifications of Project Design Matrix (PDM) and Plan of Operation (PO)	Based on the results of the Baseline Survey, both sides understood that the modifications of PDM and	PO from the version 0 to the version 1 were required, and the contents of modifications were	confirmed among the JCC participants and finalized. The details of modification are given in	Annex-1 and modified PDM and PO as version 1 are given in Annex-2 and Annex-3.	1.1 Addition of activity of "Prepare new overall organization structure"	(1-1) Prepare overall new organization structure	Responsible person: Mr. Thet Lwin 1.2 Addition of activity of "Establish Customer Service Division"	(1-3) Establish Customer Service Division	(1-3-1) Establish the Customer Service Division in Department of Water and Sanitution	(1-3-2) Define the division of duties of the Customer Service Division	Responsible person: Ms. Thwe Naing Oo	1.3 Addition of activities related to collection of Performance Indicators (PIs)	(1-4-4) Install transmission flow meter and data logger and collect flow data	(1-4-5) Procure equipment (computers, printers, software, etc.) in local offices and conduct training	(1-4-6) Collect data required for setting PIs	Responsible person: Ms. Aye Mar	1.4 Addition of activity of "Establish Water Treatment Section"	(3-1) Establish Water Treatment Section	(3-1-1) Establish Water Treatment Section in Department of Water and Sanitation	(3-1-2) Define the division of duties of the Water Treatment Section	(3-1-3) Hold a series of seminar for basic water treatment technology with study tours	Responsible person: Mr. Myint Sein	1.5 Addition of related activities to OJT on water quality management at the pilot treatment plants	(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility	(3-5-1) Procure water quality analysis and water quality management equipment	(3-5-2) Conduct OJT on water quality test and monitoring	(3-5-4) Diagnose Junction of treatment processes of Nyaunghnapm water treatment plant (3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant	through pilot basin	C R	
MINUTES OF MEETING	DE LEE JOURT COORDINALING COMMULTEE	"The Project for Improvement of Water Supply Management of YCDC"	Based on the Record of Discussions (R/D) on the Project for Immovement of Water Sunoly	Management of YCDC (hereinafter referred as "the Project") signed on 25th November 2014	between Yangon City Development Committee (hereinafter referred as "YCDC") and the	Japan International Cooperation Agency (bereinafter referred to as "JICA"), JICA has dispatched the Expert Team to Myanmar for implementation of the Project.		The $1^{st}$ meeting of the Joint Coordinating Committee (hereinafter referred to as "JCC") for the Project was held on 29 <sup>th</sup> January, 2016 after the $1^{st}$ Myanmar –Japan Joint Workshop on $27^{th}$ and $28^{th}$ January. 2016.		The following agenda was presented and discussed among the JCC participants including	YCDC, IICA, IICA Advisory Committee, IICA Expert Team as an attached participants list.	<ol> <li>The progress of the Project covering the period from July 2015 to January 2016</li> <li>PDM ver.1 and PO ver.1 to be attached in Monitoring Sheet ver.1</li> </ol>	3. Procurement of materials and equipment for the Project		In the course of discussions, the progress of the Project was confirmed on track by both sides	and main points of discussion and decisions are summarized in the attachment.		Yangon, 29 <sup>th</sup> February, 2016		) A A	May What	作 歌 到了 ()	Mr. Hirotaka SATO Mr. Soc Si Chief Advisor Committee Member	The Project for Improvement of Water Yangon City Development Committee	Supply Munagement of YCDC (YCDC),	The Republic of the Union of Myanmar					

(5-2-3) Predare an improvement rion of Avallachanin worky tearmant slow	following objectively verifiable indicator as Output of "Consolity of VCDC on institutional
(2.4.6) Pondust OTP on one of the and meinterson of the states in the states in the states of the states of the	memory of the second second as output of capacity of 1000 of institutional
(3-4-6) Conduct OJ I on operation and maintenance of water treatment plant and disinfection facility	management of water supply utility is improved <sup>70</sup> is added.
(3-4-7) Verity SOF for water quality management	A block from the same are some as a subscription of the
Responsible person: Mr. Myint Sein	"1-4. New organization structure is approved by Mayor"
1.6 Addition of activity of "Conduct OJT on improvement of water quality supplied from reservoirs"	4. Schedule of Setting PIs and their baseline data
(3-6) Conduct OJT on improvement of water quality supplied from reservoirs	
(3-6-1) Review water quality problems in reservoir water	In the original plan, PIs and their baseline data will be set approximately 6 months after the Project
(3-6-2) Research water quality improvement measure of reservoir suppled water	commencement. However, installation of flow meter (one of the important baseline data) and its
Responsible person: Mr. Myint Sein	training are required for 2 years from the commencement. The other indicators and baseline data will be set anonoximately 1 year after the Project commencement as PIs was set unvin December 2015.
Note: Bold and italic fetters are added activities.	months after commencement, and baseline values need time to collect since most of the data is
2. Other Additional Activities with Conditionality	recorded in namewriting. Andereore, die tohowing revision will be made,
	"PIs and their baseline data will be set approximately 1 to 2 year(s) after the Project commencement."
2.1 Activity of "Construct NRW management training yard and conduct training"	
In the original plan (PDM ver (0) OTT on NRW management by trainers of nilot sits is also need	3. Schedule of PO
However, to implement these training more efficiently and effectively for more staff, YCDC has	Based on the Baseline Survey and additional activities above, the revised schedule of PO has been sci
requested to construct a training yard including water meter test bench and to prepare training text If	as shown in Annex-3.
the necessity and role of training yard in a training plan on NRW management which is going to be	
prepared are conturned, construction of trauning yard and successive trauming activities will be considered by Japanese side. In this case, local equipment and materials that YCDC can routinely	<ol> <li>Procurement of Materials and Equipment</li> </ol>
procure and civil work will be responsibility of YCDC.	Based on the results of the Baseline Survey and the activities added as above, both sides confirmed the
	contents of provision of equipment required for 1) Transmission and distribution flow monitoring, 2)
2.2 Activity of "Establish computerized management system of water tariff billing and collection	Water quality monitoring, 3) Non-revenue water (NRW) management, and 4) Collection of
database"	computerized data for performance indicators.
The current billing and collection system is made mostly by manual works, which contains many mistakes, lead to inefficient work requiring large manpower, and cause large commercial loss. YCDC	Materials and equipment for construction of district metering area (DMA) for NRW management measure as pilot project in Yankin will be identified in March 2016 when the design of DMA is
is now working to shift from the current manual billing and collection system to computerized system.	completed. Then a list of additional materials and equipment required for the pilot project will be
in e-Government. A pilot project to test software of billing and collection system is being implemented	provided for consideration of procurement by the Japanese side. Both sides confirmed that in principle
and YCDC intends to extend this system to all townships in future after the pilot project. YCDC has	local materials and equipment which can be locally and routinely procured by YCDC would be
requested Japanese side to support this activity. If the detailed implementation plan of this activity is submitted by YCDC, Japanese side will consider adding it in activity and assigning an expert.	prepared by YCDC.
3. Objectively Verifiable Indicator	YCDC confirmed undertakings of YCDC with its implementation schedule for provision of equipment and responsible counterparts as listed below including securing necessary budget.
Corresponding to the addition of activity of "Prepare overall new organization structure", the	Both sides confirmed that chambers for flow meters should be designed with proper countermeasures
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YCDC confirmed that they maintain and use the equipment and materials procured properly and effectively, and collect data, analyse data and prepare report using the equipment procured.

### [List of Undertakings of YCDC]

	Incepuis	A COUNTRY AND A COUNTRY	-
Undertakings of YCDC	DYCE	r Counte	crparts
Transmission and Distribution flow monitoring			
To design chambers for flow meters	Mr. My	int Mr. Za	w Min
Wwith assistance of Japanese experts on designing and supervising	Sein	Htut	
To obtain permission for digging by September 2016 (especially, at		_	
Shwedagon reservoir site etc.)			
To construct chambers for flow meters			
To take security measures for flow meters and panels (constructing gates			
and fences)			
To supply electricity to the site			
Collection of computerized data for Performance indicators			
To deliver and install all provided equipment (such as PCs) to each branch	Ms. Th	we Ms. Ay	ye Aya
office.	Naing Oo	Mar	
To secure space for installing PCs			
To procure consumables (including printer inks)		_	
To bear necessary operational costs for the training			
To update anti-virus software periodically			
To take security measures			
To prohibit from unintended use			
Non-revenue water management		-	
To procure materials which YCDC can procure locally and routinely	Mr. T	het Mr. Za	w Min
To secure storage space for the equipment and materials procured	Lwin	Htut	
To conduct civil works for construction of DMA (digging, piping,			
back-filling, and restoration)			
To proceed necessary procedures for approval for civil works	l		
Water quality monitoring			
To secure space for procured equipment in laboratory in Head Office.	Mr. My	int Ms. Ei	Khine
To set up site laboratories in water treatment plant and pumping stations.	Sein	Mon	
To allocate space for equipment in reservoir sites for equipment			
To procure reagents for the equipment procured by Japanese side (Japanese		-	
side will provide necessary amount for 6 months after procurement and			

	Responsi	ble Counterparts
Undertakings of YCDC	DYCE 01 ACE	Counterpar
installation for training purpose)		
To assign necessary staff for C/Ps		
To conduct daily maintenance		

The planned schedule of design, procurement and construction related to procurement of materials and equipment are shown in the table below. YCDC will carry out their tasks according to this schedule, especially, of construction of chambers for flow meter. To start the procurement of materials and equipment and implement activities related to procurement of materials and equipment and implement activities related to procurement of materials and equipment and implement activities related to procurement of materials and equipment and implement activities telated to be submitted by the Myanmar side to the Japanese side by the end of March at latest, 2016. Otherwise, the related activities and the Project itself will be delayed. YCDC understood that the coordination and effort of the Myanmar side for expedition is required implementing the Project according to the schedule.

Activities related to procurement of materials and						20	18	These						2017	
winishinks.	5	3	Mar	PA -	thay.	Jun	R	<b>Fuk</b>	95	Dot	NON	99C	dan	Feb	Mar
. Transmission and distribution flow	1			Ļ			Process			-	2	of and ya	g		
nonitoring system								Ĺ	Ľ				L		
roome now mercer and data by bullon mains and data at transmission and distribution mains and data pollection.		1	an and	and motion	W Ki wat	8				diamber a	the manual states	-		_	
Collection of computerized data for Performance indicators		1	11-		-	-				-	1	1	-		1
Procure equipment (computers, printers, artware, etc.) in local offices and collect computerized data		-	- 11		Proces	4	- united	and fram	-	-			=	_	_
3. Non-revenue water (NRW) management	1	1													
and implement countermeasure for physical loss of the pilot area					1	11	Prove			1		-	buse	L	n_
t. DMA pilot project fro NRW management	t	1	Ι												
Produce pipe, valves, etc. for setting up DMAs in the right area, and implement NRW manament	-	_					R.	sea					Training		П
Teasures													Π.		
5. Water Quality Monitoring and management	í.	1				Ŀ	- F		_	_					1
Procure water quality analysis and management equipment, and collect data						004					Itano				1
<ul> <li>The timing when materials and equipment are required.</li> </ul>		h -	- m :	ubmis	sion o	AAR	guest	Form	or Pri	cureme	antby			1	

# 7. Other Materials and Equipment with Conditionality

### 7.1 Water Quality Monitoring

To analyze priority parameters of Myanmar water quality standards, UV-vis spectrophoto meter is required However, reagent for this equipment is expensive in Myanmar and use of it is considered as not sustainable. Therefore, procurement of this equipment is still under the study.

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As explained in 2.1, if construction of training yard is implemented, required yard house and local materials and equipment which YCDC can procure routinely will be procured by the Myanmar side.

# 8. Process for modification of PDM and PO

The necessary procedure of the modification of PDM was confirmed as below.

- 1) JCC proposes the amendment of the PDM and PO.
- 2) Amendment of Record of Discussions (R/D), including PDM and PO, is drafted and approved by
- 3) YCDC and JICA Myanmar Office sign Minutes of Meetings to amend R/D.

(End)

Annex-1: Contents of Modification for Additional Activities Annex-2: PDM version 1

Annex-3: PO version 1

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Annex-1: Contents of Modification for Additional Activities

1.1 Addition of activity of "Prepare overall new organization structure"

During the baseline survey, the JICA expert team found the Water and Sanitation Department lacks essential sections/divisions as waterworks. These sections/divisions include NRW Management. Planning, Customer Service, Water Treatment, and Transmission and Distribution Management. Establishment of NRW management Unit/Section and Planning Section is specified in the original PDM. If an organization structure is inadequate, adequate functions of waterworks are not served, which also jeopardize the outputs of the Project. Therefore, the activity to prepare overall new organization structure will be added in PDM ver.1. This activity includes review of existing organization, identification of required sections/divisions, and prepare overall new organization.

1.2. Addition of activity of "Establish Customer Service Division"

(1-1) Prepare overall new organization structure

Customer Service Division dealing with their customers deems essential as waterworks to respond to complaints, to maintain customer database, and to conduct tariff billing and collection for provision of better service to the customers. The following activities to establish this division will be added in PDM ver.1.

(1-3) Establish Customer Service Division

(1-3-1) Establish the Customer Service Division in Department of Water and Sanitation (1-3-2) Define the division of duties of the Customer Service Division

1.3 Addition of activities related to collection of Performance Indicators (PIs)

In the course of the activity "(1-2-3) Identify the important and available Performance Indicators to be monitored (e.g. water supply ratio, water supply hours, NRW, etc.)" in PDM ver.0, it was found that production and transmission flow data and various data in local offices are essential for monitoring PIs to achieve Output 1. However, currently, almost no flow data is collected so that the essential values or indicators of water production volume and transmission flow as a waterworks are unknown. Therefore, to collect flow rate, flow meter system will be installed and flow data will be collected. Furthermore, almost all data in all townships and local stations such as pumping station are kept in handwritten record and manually calculated. To collect values of performance indicators (Pls) and supporting data and analyse them more efficiently, computerized data will be generated and collected from local stations and townships installing computer, printer, etc.

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Therefore, the following activities to collect flow data and computerized data from local offices will	(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant
be added in PDM ver.1.	(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant
	through pilot basin
(1-3-4) Install transmission flow meter and data logger and collect flow data	(3-5-5) Prepare an improvement plan of Nyaunghnapin water treatment plant
(1-3-5) Procure equipment (computers, printers, etc.) for computerized data management system in	(3-4-6) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility
local offices and conduct training	(3-4-7) Verify SOP for water quality management
7-3-6) Collect data required for setting PIs	
	1.6 Addition of activity of "Conduct OJT on improvement of water quality supplied from reservoirs"
1.4 Addition of activity of "Establish Water Treatment Section"	
	In the activity of "(3-4) Conduct O/T on water quality management at the pilot treatment plants and
Previously, there is no water treatment plant in Yangon but the first water treatment plant was	disinfection facilities" in PDM ver. 0, O/T on water quality management targets the pilot treatment
constructed at Nyaunghnapin in 2005 and the second phase of Nyaunghnapin was constructed in 2013.	plants and disinfection facilities but not reservoir water quality. In the course of the baseline survey, it
Furthermore, Lagunbyin water treatment plant is under construction and a feasibility study on	was found that the improvement of reservoir water is also required. Water of Gyobyn, Phugyi, and
Kokkowa water treatment plant is being carried out as the first river water treatment plant. The water	Hlawga reservoirs is supplied directly to the city without treatment so that supplied water contains
reatment plant is going to increase in future. However, there is no section on water treatment and	foreign substances such as suspended solid (SS). Even if water from water treatment plant is safe and
enough knowledge and experience on treatment technology are not accumulated. To produce safe and	clean, without improvement of quality of water supplied from reservoirs, city water overall is not safe
clean water, acquiring and developing water treatment technology and capacity of planning, designing.	and clean. In addition, SS from reservoirs chokes customer water meter, which causes damage to
and operation and maintenance of treatment plant is required and water treatment engineers should be	water meter.
leveloped. For these purposes, Water Treatment Section deems essential as a focal point on water	
reatment technology. The following activities to establish Water Treatment Section will be added in	To achieve Output 3, improving reservoir water quality is essential to supply clean water and solve
PDM vet.1.	meter damage. For this purpose, the following activities will be added.
(3-1) Establish Water Treatment Section	(3-6) Conduct OJT on improvement of water quality supplied from reservoirs
3-1-1) Establish Water Treatment Section in Department of Water and Sanitation	(3-6-1) Review water quality problems in reservoir water
3-1-2) Define the division of duties of the Water Treatment Section	(3-6-2) Research water quality improvement plan of reservoir suppled water
(3-1-3) Hold a series of seminar for basic water treatment technology with study tours	
	Note: Bold and italic letters are added activities.
1.5 Addition of related activities to OJT on water quality management at the pilot treatment plants	
Some of the design criteria of the Nyaunghnapin water treatment plant are unknown, the filter cannot	)
perform well, and some design has defect. Therefore, the preparation of operation and maintenance	

required and, as a result, adequate manuals and SOPs can be prepared and O&M training can be possible now. To achieve proper function of the water treatment plant, improvement measures are manuals and standard operation procedure (SOP) which planned as activity 3-3-1 in PDM ver.0 is not possible. Therefore, the following activities in bold and italic will be added in PDM ver.1. Some of the perform well

(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility (3-5-1) Procure water quality analysis and water quality management equipment (3-5-2) Conduct OJT on water quality test and monitoring

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<ul> <li>(1-4-3) Identify the important and available Performance indicators to be monitored (e.g. water supply natio, water supply hours, NRW, etc.).</li> <li>(1-4-4) Install transmission flow meter and data logger and collect flow data</li> <li>(1-4-5) Procure equipment (computers, printers, software, etc.) in local offices and conduct training</li> <li>(1-4-5) Procure equipment (computers, printers, software, etc.) in local offices and conduct training</li> <li>(1-4-5) Collect data required for setting Pla</li> <li>(1-4-5) Collect data required for setting Pla</li> <li>(1-4-5) Collect data required for setting Pla</li> <li>(1-4-5) Calculate the Performance Indicators</li> <li>(1-4-5) Collect and nonicor the Performance Indicators</li> <li>(1-4-5) Comulate and nonicor the Performance Indicators periodically</li> <li>(1-5) Formulate regulations, standards and guidelines</li> <li>(1-5-1) Review the existing rules, regulations, standards and guidelines</li> <li>(1-5-2) Identify regulation, standards and guidelines to be modified and/or newly formulated</li> <li>(1-5-3) Danth necessary negulation, standards and guidelines, which can be prepared by VCDC (e.g. design, construction and material standards for distribution pipes, service pipes and meters, taniff collection manuals, guidelines of tariff setting)</li> </ul>	Water Supply Facilities - Water Quality Mmagement - Project Coordination 2) Experts from waterworks Institutional Management (Planning, Finance/Business Management, Regulation/Sland ard/Guideline, PR, Human Resource), NRW Management (NRW Engineering, Customer Service, Taniff Collection), Water Quality Management (Water Treatment Engineering, Water Quality Engineering)	accessories) > To supply electricity to the site • Water quality nonitoring: > To secure space for provisional equipment in laboratory in Head Office. > To allocate space for equipment in reservoir site for equipment. > To procure reagents for the equipment pocured by Japanese side (Japanese side will provide necessary amount for 6 <sup>th</sup> month alter procurement and	
<ul> <li>setting, PP(etc.)</li> <li>(1-4): Conduct ODT on development of asset ledger</li> <li>(1-7): Strengthen Public Relations <ul> <li>(1-7): Strengthen Public Relations</li> <li>(1-7): Strengthen Public Relations on water service of YCDC</li> <li>(1-7): Conduct NW and ensers main or YCDC staff</li> <li>(1-7): Conduct NW and the public relations activities</li> </ul> </li> <li>(1-8): Strengthen human resources development <ul> <li>(1-8): Strengthen human resources development</li> <li>(1-8): Strengthen human resources development system</li> <li>(1-8): Strengthen human resources development system</li> <li>(1-8): Conduct trainings of trainers for planning and organizing the trainings</li> <li>(1-8): Conduct trainings of trainers for planning and organizing the trainings</li> <li>(1-8): Conduct trainings of trainers for planning and organizing the trainings</li> <li>(1-8): Strengthen human resources development plans</li> <li>(1-8): Strengthen priority activities as a part of implementing the 5-year human resources development plans</li> <li>(1-9): Develop 5-year and 10-year institutional management plans</li> <li>(1-9): Develop 5-year and 10-year institutional management plans</li> <li>(1-9): Develop 5-year and 10-year institutional management plans</li> <li>(1-9): Davidy of VCDC on NRW management is improved.</li> </ul> </li> <li>(2-1): Establish NRW Management Unit <ul> <li>(2-1): Establish NRW Management Unit</li> <li>(2-1): 2): Define the division of dutes of NRW Management Unit</li> </ul> </li> </ul>	<ul> <li>and acast management, Flow meter and data logger for flow monitoring system, Computers and printers, Software, etc.</li> <li>3. Overseas Training Program Training in Japan and/or neighboring countries</li> <li>4. Local cost</li> </ul>	<ul> <li>routinely</li> <li>To secure storage space for the equipment and materials procured</li> <li>To construction of DMA (digging, piping, back-filling, and restoration)</li> <li>Collection of computerized data for Performance indicators</li> <li>To deliver and installation of all provided equipment (such as PCS) to each branch office.</li> <li>To secure space for installing PCS</li> <li>To bear necessary operational costs for the maining</li> <li>To bear necessary operational costs for the maining</li> <li>To bear and costs software</li> </ul>	
<ul> <li>(2-2) Collect and compile information of NRW</li> <li>(2-2) Collect and compile information of RNEW</li> <li>(2-2-1) Collect information of RNEW and implement a baseline survey</li> <li>(2-2-2) Compile information of pipes for establishment of CIS</li> <li>(2-2-3) Compile information ind database</li> <li>(2-2-4) Formulate Standard Operation Procedure (SOP) of the above information management</li> <li>(2-3) Develop a model on the management of physical loss (leakage, over flow) and human resources development</li> <li>(2-4) Develop a model on the management of physical loss (leakage, over flow) and human resources development</li> <li>(2-5) Develop a model on the management of physical loss (leakage, over flow) and human resources development</li> <li>(2-4) Formulate manals on physical loss</li> <li>(2-4) Formulate manals on physical loss</li> <li>(2-5) Ordute OfT-T by the trainers</li> <li>(2-5) Ordute of rol NRW management of the countermeasures is the laken for reducing physical loss is like pilot areas</li> <li>(2-5) Set up DMAs at the pilot areas</li> <li>(2-5) Set up DMAs at the pilot areas against physical loss in the pilot area and formulate the optimal model</li> </ul>		periodically • Civil work (construction of flow meter chamber), Safety fence for flow meters and panels, and electricity supply for flow meter installation	

### ANNEX-2: PDM version 1

Impert Name     The Project for Improvement of Water Supply Manage       Executing Agency     Yaugon City Development Committee (hereinafterrefe roject Sites       Greater Yangon       Isreet Group     Staff of YCDC       Nireet beneficiaries     Staff of YCDC       indirect Beaeficiaries     People living in the water supply areas of YCDC	ment of VCDC (PDM Ver.1) rreed as "VCDC")		Duration of the Pro	ject: 5 years (5 <sup>th</sup> July to 4 <sup>rd</sup> July 202 PDM Version 1 (February 201
Narrative Summary	Objectively	Verifiable Indicator	Means of Verification	Important Assumptions
[Overall Goal] Water supply services provided by YCDC are enhanced.	<ol> <li>The performance indicators (PIs) a Project commencement<sup>1</sup></li> <li>NRW is decreased from xx% to xx</li> <li>The ratio of water quality test result increased from xx% to xx%.</li> </ol>	re improved compared to the data at the % in the water supply area of YCDC is which satisfy water quality standards is	Reports prepared by YCDC	
[Project Purpose] Capacity of YCDC on the management of water supply service is improved.	<ol> <li>Evaluation of Plasis conducted per</li> <li>NRWis decreased from xx% to xx</li> <li>The ratio of water quality test result increased from xx% to xx% in the</li> </ol>	iodically % in the pilot area is which satisfy water quality standard is pilot treatment plants'	Reports prepared by YCDC	Fund for YCDC to enable it to execute construction and rehabilitation of facilities such as water treatment plants, disinfection equipment and pipelines is available.
[Outputs] I. Capacity of YCDC on institutional management of water supply utility is improved.	<ol> <li>Plan for institutional management</li> <li>Plan for human resources develop Government.</li> <li>Jrafts of regulations, studands au Yangon is approved by Yangon i La New omenization function is any</li> </ol>	t is approved by Yangon Region Government ment is approved by Yangon Region ad guidelines for water supply services in Region Government rowed by Mavor	Reports prepared by YCDC	
2. Capacity of YCDC on NRW management is improved.	<ul> <li>2-1 Manuals and training materials an YCDC staff</li> <li>2-2 Information of customers and pip 2-3 xx% of YCDC staff participates to 2-4 Plan for NRW reduction is anorm</li> </ul>	e fully utilized by more than xx persons of es for the pilot areas is compiled and updated raining on NRW well by VCDC	Reports prepared by YCDC	
<ol> <li>Capacity of VCDC on water quality management is improved.</li> </ol>	<ol> <li>Manuals and training materials an YCDC staff</li> <li>Result of the water quality test at monitored periodically</li> <li>3 xx86 of YCDC staff participates to 3 4 Plan for innorvement of water on</li> </ol>	e fully utilized by more than xx persons of the pilot treatment plants is recorded and mining on water quality ality is approved by YCDC	Reports prepared by YCDC	
Activities]		(I)	nputs)	
. Capacity of YCDC on institutional management of water supply utility is improve	d.	Japanese side	Myanmar side	[Pre-condition]
<ul> <li>1-1) Prepare overall new organization structure</li> <li>1-2) Establish the Planaing Section <ol> <li>(1-2-1) Establish the Planning Section in Department of Water and Sanitation <ol> <li>(1-2-2) Define the division of duties of the Planning Section</li> </ol> </li> <li>(1-3) Establish Customer Service Division <ol> <li>(1-3-1) Establish the Customer Service Division in Department of Water and Sanitation</li> <li>(1-3-2) Define the division of duties of the Customer Service Division</li> </ol> </li> <li>(1-4) Develop and Monitor Performance Indicators (PIs) <ol> <li>(1-4) Review the carrent method of calculation and monitoring of performance </li> </ol> </li> </ol></li></ul>	tation data ance Indicators.	Experts     Consultant team     Consultant team     Chief Advisor (Water Supply     Operation     Institutional Capacity Development     / Human Resources Management     Plauming (Monitoring     Financial / Business Management-     NRW (Commercial Loss)     ORS     GIS     Operation and Maintenance of	<ol> <li>Counterpart personnel</li> <li>Office space and facilities</li> <li>Necessary data/information</li> <li>Local cost fo: implementation of the activities</li> <li>Distribution flow monitoring</li> <li>To design and construct chambers for flow meters</li> <li>To take security measures (constructing gates and fences for flow meters and other</li> </ol>	<ol> <li>Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management</li> </ol>

The pilot water freatment plants will be existing Nyaunghnapin Water Treatment Plant and Lagunbyin Water Treatment Plant under construction.

### Annex-3: PO version 1

		Secol	1.00					Sc	chedule		-			_	Responsible	Experi/YCDC	0.0.0
O Activity N	0.	Expected	Necessary Duration	-			Phase 1			0.043	DOWN	Phase	0010	1 2020	Organ	20000	Collabor
	and the second s	Concentration	Dia Mont	hillsen	Oct-Dec	Jan-Mar	Ann lun	Jul-Seo	Oct-Dec	Jan-Mar	2017	2010	2019	2020	Japan	YCDC	-
niel Advisor	Water Supply Operation (CA)	-	-	our orep	- OULDING			- un cop		- success	1						
dibilional C.	andity Development / Human Resource Management (HR)				1	-		-				-		-			
maty CA/P	anning (Monitoring (DCA/Plan)				-						-	-		-			-
opcial / Ru	timest Manunamani /FRM								-	-		-		-			-
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ter Quality	Management (WOM)						1		1			1		_			-
istance for	Water Supply Operation (AWSO)								1.2	· · · · · · · · · · · · · · · · · · ·							
ject Coord	nation/ Assistance for Planning / Monitoring										1						
paration at	Work Plan Phase 1 (Draft) and Monitoring Sheet Ver 1 and	-		_		_									CA		
noissuo			1.000	-						(					50	-	-
peration of	Work Plan Phase 2 (Draft) and Monitoring Sheet Ver.4 and										-				CA		
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by of mate	tala to be procured and their procurement		-	-	-						-			-	CA, DCA/Plan	Rélevant CP	-
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suration of	niplict completing terrat										-	-		F .	CA DCA		-
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loct 1: Car	anthy of VCDC on institutional management is improved																
free at any	any or roco of autocontributing and a supravor.														and the second sec	1	
-1 Preor	ne overali neve ostanization structure		R	1.00	-	18		-			-	10000	1 - C	1000	CA, DCA, HR	Internet and	1000
and the second		1	and the second second		1	No.			1	Leon-				-	CA. DCA/Plan	Tean 1-1	-
-2 Estab	lish Planning Section								1.1			· · · · · ·					
Take	Establish the Planning Section in Department of Wave and	-		-	-		-			-	-			-			
1-2-	Savitation	-			-	-	-	-		-							
4.2	Define the sthusion of shallost of the Disamine Castley																
1.40	Denie ne nivosariai sobes or sie Famining Sectori										_			-			-
-3 Esust	Ish Customer Service Division	6 8	13 1	1 1						-1		11-2-11		100	FBM, New expert	Team 1-3. Team 2	-
2.2	- Establish the Customer Service Division in Department of	A. Summer	Aug Comment	1 -1	1	in			in the second		10-21	1.000	1 V	1000	1		1.
1.0	Water and Senitalion	÷	1000	the second second	- Jon		1							Sec. 1			1
1-3-	2 Define the division of duties of the Customer Service	1000		0	- 20		1.0				Contraction (Section 1997)	A 0 13		121		1	17
-4 Devel	Division	0	America		C. Concernance			ALC: NO.			Concern of			-	Plan	Team1-1,	-
	of any relation a solution and an and a list	-	-	· · · · · · · · · · · · · · · · · · ·		-			-	-	-			-	-	Proposed	
1-4-	Review file current method of calculation and monitoring of performance data			-				_	-					-			
201	Conduct training of trainers on the calculation and		-				1								1		
3-4-	monitoring of Performance Indicators.				100 million (1997)						1			1			
_	and the second se			7		-		1	1						1		
5-4-	Identity the necessary and available Performance indicators to be manifored		1.1.1	1				·						1.1			
					1 = =	4	1-51	1			1000	1	- 1	TA		The Th	1
1-4-	Install frammission flow meter and state logger and collect flow data					-	-	1			-	/		2			100
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1444	Frocue equipment (computers, printers, software, etc.) in	1		1			-	-			2.1			1.7			
-	and a strange a strange	-	10000	10. 10 1 manual	1			Surger and	in the second	L	1	1					
Tele	Collect data required for setting Pls	100		1	1200	-				-	-	******	*****			1	
1	Develop calculation method, manuals and mentioned	-	-	A	1	1000	1							-		Contraction of the	1
1-4-	system of Performance Indicators			1.00	Y 11		-			1						/	15/
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of notivitian		
(2-3-12) Implement OIT by the trainers in the pilot area (2-3-12) Verify the manuals on physical loss		
(24) Develop a model on the management of commercial loss (meter fault, miss reading of meter, Ilegal connection) and		
(24-1) Review current situation and develop phased countermeasures		
(2-4-2) Conduct trainings of trainings (2-4-3) Prepare training plan and training materials by the miners		
(2-4-4) Formulate manuals on commercial loss (2-4-5) Conduct Off-JT by the trainers		
(2-4-6) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the		
(2-4-7) Conduct the countermeasures against commercial loss in the pilot area		
(2-4-8) Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model of activities		
(2-4-9) Implement (OT by the trainers in the pilot area (2-4-10) Verify the manuals on commercial loss		
2-5) Develop and support implementation of the NRW management plans		
(2-5-1) Develop 5-year and 10-year NRW management plans (2-5-2) Launch priority activities as a part of implementing the 5-year NRW management plan		
. Capacity of YCDC or water quality management is improved.		
3-1) Establish Water Treatment Section		
(3-1-1) Establish Water Treatment Section in Department of Water and Sanitation (3-1-2) Define the division of duties of the Water Treatment Section		
(3-)-3) Hold a series of seminar for basic water treatment technology with study tours		
-2) Review current situation and formulate phased countermeasures		
3-3) Conduct training of trainers on water quality management		
(3-3-1) Conduct training of trainers on the water quality management (3-3-2) Prepare the training plan and training materials by the trainers		
(3-3-3) Conduct Off-IT by the trainers		
3-4) Develop SOP for water quality management		
(3-4-1) Develop SOP on operation and maintenance of water treatment plant and disinfection facility		
8-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility		
(3-5-1) Procure water quality analysis and water quality management equipment		
(3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant		
(3-5-4) Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin (3-5-5) Prevare an improvement plan of Nyaunghnapin water treatment plant		
(3-5-6) Conduct OIT on operation and maintenance of water treatment plant and disinfection facility (3-5-7) Verify SOP for water quality management		
i-6) Conduct Off on intprovement of water quality supplied from reservoirs		
(3-6-1) Review water quality problems in reservoir water (3-6-2) Research water quality improvement measure of reservoir suppled water		
1-7) Develop and support implementation of the water quality management plans		
(3-7-1) Develop 5-year and 10-year water quality management plans (3-7-2) Launch priority activities as a next of implementing 5-year water quality management plans		
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the max maximum meat with be set approximately 1 to 2 years) when the Project commencement, Considering the monitorin	Treams or a 12, in fer surges or respective 145 with	a sequence of the state of the state of the second of the

		in the second					A	Sc	hedule					_	Responsible	Expert/YCOC	A DECEMBER
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1.5.55	Calery a cilled source for MDM management and stilling			Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	-			-	Japan	YCDC	1
1.0-0	Present action of an and encoment of according							-						-			
2-3-7	(Insinge survey and repuir) for the countermeasure to be taken for physical loss in the pilot area							-		*****				+			
2-3-8	Set up DMAs at line pilot area (including procure materials and construct DMA).				-												
239	Conduct the countermeasures against physical loss in the	-	-		-						-			-			
2-3-10	profit real Evaluate cast-benefit of countermeasures against physical loss of the pilot area and formulate the optimal model of activities.									1							
2-3-11	Implement OUT by the trainers											-					
2-3-12	2. Verifythe manuals on physical loss				10			1			-	-					-
Develo loss (m human 2-4-1	p a missel on the management of commercial (non-physical) inter fault, miss reading of motor: flegal connection) and resociose development Review current situation and develop phesed														NRW(NPL)	Team2, Yankin Township, Proposed NRW Management	
242	Conduct trainings of trainers			-								-				Secton	
2-4-3	Prepare training plan and training materials by the trainers				-		_	-	-		-						
2-4-4	Formulate monuals on commercial loss						-	_			_	-	-	-			
2.4-5	Conduct Diff-JT by the training													-			
2-4-6	Prepare action plan and processment of equipment for the countermeasurer, to be taken for commercial loss in the selected plack area				-		-	-									1
2-4-7	Conduct the countermeasures against commercial loss in the pibli area				-						-		-				
2-4-8	Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model of activities.	11								-							
2-4-9	Implanient OJT by the trainers in the pilot area	1.1.1					[]			1	-	-	-	-			
2-4-10	Varify he manuals on commercial loss	1					1.000				-		_	-		-	
5 Develop	p and support implementation of the NRW management									$\bar{\mu} = 0$	1				CA, NRW	Team2, Proposed NRW	1.
2-5-1	Develop 5-year and 10-year NRW management plans						History (				_	-				Management Section	
2.5.2	Eaunch priority activities as a part of implementing the 5- year NRW management dan				-							1	-			1.1	() ——
put 3. Capar	city of YCDC on water quality management is improved.						-	1		1000	1						
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2.1.1	Establish the Water Treatment Section in Department of	-		1000				500000						-	r san, New expert	redin 2	
341	Water and Sanitation Define the division of duties of the Water Treatment			-										-			
10.64	Section	12.5						10000			5-1			1			
3-1-3 2 Review	How a series of seminar for basic water treatment sechnology with study tours in treatment facilities current situation and formulate phased ocurrent processing	1		1	1 - V										HOLL OTH	Tanana	1
3 Conduct	t training of Irainers on water quality management										_				WQM, D&M	Wate: Quality	
3-3-1	Conduct training of trainers on the water quality	-										_				Section, Water	
3-3-2	Prepare the training plan and training manuals by the trainers			-			1						_			Reservoir Division	1
3-3-3	Compart Off-JT by the trainers													-		1	11

		Expected	Necessary	-			Phase 1	30	negone.		-	Pha	te 2	-	Responsible	Exper/YCDC	Colaborator
Activity No.		Oulcomes	Durition	2	015		2	016	-	2017	2017	2018	2019	2020	Organ	12.9000	
140	Parketter Bartoning Institutes	-	-	Jul-Sep	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mer				-	Japan	YCDC	
(-+p	Caccase Performance indicators						-							-		1.1	
1-4-9	Update and monitor the Performance indicators periodically		1.1													1	
Farmul	ite regulations, standards and guidelines	-	1.11			1			1					1.1	Plan	Team1-2,	
1.5.1	Review the existing rules, regulations, stantiards and		1		-				-		-		-	-		Planning	
1.1.1	guidelines Identify regulation, standards and guidelines to be modified			-										-		Secton	
1-5-2	and/or newly formulated										_	_		-		1.0.1	
1-6-3	Contractionary regulation, standards and guidelines, which can be prepared by YCDC	12	N.803			100 C		-						1			-
Entranc	e undestanding on financial menagement							der son al		loren a	1000			1.1	FBM	Team1-3 (Finance	10.00
1-6-1	Analyze the current financial management system		-		_								_			Section)	
1-6-2	sustanable operation of wher supply service in			-		_	-	100001	1		_		_	-		1 Canal	
1	coentideration of future development plans	-		-					-		-			-			
1-6-3	Conviuct GJT on development of asset ledger	-								1	S		-	1	-		
Strango	ven Public Relations	-	1		1	1000						1		1.21	wwso	Sector	10.00
3-7-1	Analyze the effective public relations on water service of YCDC			(		-											
1.7-2	Conduct awareness raising of YCDC staff	-	1	2			Sec. 14	-			_						
1.7.3	Conduct Q.IT on the public relations activities	-	-				-	-			-			-			
Rivert	the first sector is a feature and the													-	HIR	Tean1-4	
a contract	Perinan resources development	-								1.11				-		(Administration	
1.8.7	Identily necessary improvement on structure and materials				_	-	*****									Section)	
1994	of the stainings	-				-				-	_			-			
1-8-3	the frainings									-							
1-8-4	Develop 5-year and 10-year human resources development								· · · · · · · · · · · · · · · · · · ·	1	_	_					
1.665	Lavinch priority activities as a part of implementing the 5-		-				-	-				_			-		
Develop	year human resources development plan	-	-	-										-	CA DEA/Blas	Termine L2	-
manage	ment plans						_							_	FBM, HR, AW50	1-3, 1-4	
1.9.1	Develop 5-year and 10-year institutional management plans	-			1			· · · · · · · · · · · · · · · · · · ·	-		-	-				1.00	
1-5-2	Launch priority activities as a part of implementing the 5- year institutional monomement plan					1	1						-	-			
at 2. Capac	ity of YCDC on NRW management is improved.										1.0						
Establish	NRW Management Unit	1	-	1											CA, NRW	Team2	
2-1-1	Estativish NRW Management Unit	-	-											-			
2-1-2	Define the division of duties of NRW Management Unit					_					1.000	1.0					
Collect	ind complia Internation of NRW	-										1	-		NRW	Team2,	
-	Collegi information of NEW and implement a baseline	-	-		-					-				-		Proposed NRW Management	
2-2-1	surviey	_	_													Section	
2-2-2	Comple information of pipes for establishment of GIS Comple customer information into database	-	-		-			-	-							1.1	
2.2.4	Formulate Standard Operation Procedure (SOP) of the			1			1				_			_			
Develop	a model on the management of physical loss (leakage,	-	-										-		NRW(PL)	Teen2, Yankin	
over flow	and human resources development	-	-					in the second						-	1	Township,	
2-3-1	counting and a second state of the second states of		1.0	-	-				_							Management	
2-3-2	Conduct trainings of training			1		-		-	-		-	-				1000	
2-3-3	Prepare training plan and training malietials by the trainers			1			-	-	-	-		-					
2-3-4	Formulae manuals on physical long						1					-				1	V
ALC: NO. 1	and a state of the															1 - A - A - A - A - A - A - A - A - A -	10/

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S OF MEETING RDINATING COMMITTEE FOR Water Supply Management of YCDC" on the Project for Improvement of Water Supp on the Project") signed on 25th Novemb Committee (hereinafter referred as "YCDC") a v (hereinafter referred to as "IICA"), JICA h	for implementation of the Project since 4th Jul	Committee (hereinafter referred to as "JCC") fo C was held on 24th August, 2016.	discussed among the JCC participants including Team as an attached participants list. The period from February to August 2016 and materials and its related activities of Constructions 6 1 of ICC	onfirmation of necessary process (W) management ement plan for WTP () and Monitoring Sheet Version 2	ed by both sides that the progress of the Project i XW management, Modified PO given in Annex-I discussed and decided are summarized in the	Yangon, 7th October, 201	nedlo-	Daw May May Thwe Committee Member Y angon City Development Committee (YCDC), The Republic of the Union of Myanmar
MINUTES MINUTES OF THE JOINT COOI "The Project for Improvement of "The Project for Improvement of Based on the Record of Discussions (R/D) Management of YCDC (hereinafter referre 2014 between Vangon City Development ( the Japan International Cooperation Agen	dispatched the Expert Team to Myanmar 2015.	The $2^{nd}$ meeting of the Joint Coordinating the Project chaired by the Secretary of YCD	The following agenda was presented and YCDC counterparts, JICA, and JICA Expert 1. The progress of the Project covering th 2. Progress of procurement of equipment 3. Conferencion of B assessmented of one and	<ol> <li>Progress of re-organization plan and o</li> <li>Facilitation of Non-revenue water (NR</li> <li>Confirmation of water quality improve</li> <li>Modification of Plan of Operation (PC</li> </ol>	In the course of discussions, it was confirm on the track except the pilot project for NF was agreed in both sides. Main points attachment.		征豫武	Mr. Hirotaka Sato Chief Advisor The Project for Improvement of Water Supply Management of YCDC
Activity No.  Activity No.  Dervelop 50(* for water quality management 3.4-12 Develop 50(* on water quality total and monitoring 3.4-22 Develop 50(* on water quality total and monitoring 3.4-22 Develop 50(* on parameter state) and at 3 disinflection facility plants and distribution facilities 3.4-3 Process water quality analysis and water quality 3.4-3 Process water quality analysis and water quality 3.4-3 Develop and the subment 3.4-5 Develop 3.4-5 Develo	Expected Peceasary Outcomes Dartier	2015 Jul-Sep Oct	Phase 1 Dec Jan-Mar Aor-Jun	Schedule 2016 Oct-Dec	2017 2017 2018 Jan-Mar	2019	2020         Res           2020         WOM, C           WOM, O         WOM, O	ponsible ExpertYCDC Organization Denn VCDC SM Water Custily Monitoring Section, Water Paservoli Division Section, Water Reservoli Division

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Main
Attachment:

# 1. Confirmation of Recommendations and Conclusions of 1st JCC

The following recommendations and conclusions adopted in the 1st JCC were reconfirmed as a YCDC important policy.

- Adopt six visions for goals of Engineering Department (Water and Sanitation) (EDWS) of YCDC
- (2) Study recommendations made by JICA Advisory Committee, JICA and JICA Experts and implement it with our continuous best effort to achieve YCDC's visions
- (3) Continue Capacity Building (training) based on Modified PDM version 1 and PO version 1 in cooperation with JICA Experts aiming at making a good business cycle
  - (4) Assure new organization structure for more efficient and effective management of EDWS
- (5) Sustainable management style suitable for Myanmar will be continuously studied, with assistance of JICA Experts and further JICA assistance

# 2. Other Additional Activities with Conditionality

The following additional activities proposed in the  $1^{41}$  JCC will be further studied and discussed in the next JCC  $(3^{16})$ .

- (1) Construction of NRW management training yard and conducting trainings utilizing the yard
  - (2) Establish computerized management system of water tariff billing and collection database

# 3. Procurement of Materials and Equipment

The current status of procurement of equipment was presented by the JICA expert and future schedule is set as follows.

No.		-	N	173			4		4
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ltem	monitoring	YCDC	tent for data and	quality	Detection		Excavator	Pipe, valves, fittings, etc	na hode
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The current status and schedule of procurement of equipment

### 4. Comments from chair (Secretary)

- Organization Chart
- For approval process of the Organization Reform was explained as follows: 1) Approval from the Mayor.
  - The proposal will be submitted and explained by YCDC.
- 2) Approval by the Region Government.
- The proposal will be submitted and explained by YCDC.
  - 3) Approval by the Cabinet (Regional Cabinet)
- The proposal will be submitted and explained by the Mayor Recommendation letter will be attached by the Regional Government.
- 4) Approval by the Union Government.
- The proposal will be submitted and explained by the Regional Government.
- Human Resources Development (HRD)

HDR section has clarified the duties and responsibilities for enhancing staff's understanding and has conducted surveys to promote staffs' capacity development. New sections in the proposed organization chart are imperative for EDWS.

Customer Services & Public Relation

The new government's policy is citizens' centered policy. So the duties of Customer Service Team

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and Public Relations Team are vital and need to implement systematically.

Regulations, Standards & Guidelines

All stakeholders should understand YCDC's regulations, standards and guidelines well. YCDC should make a clear standard and guideline for ourselves, the public and other stakeholders. Since it is essential for the YCDC, I would like to request IICA Expert Team to help us make secured and accurate standards and guidelines as early as possible.

• GIS

Other Departments such as Urban Development Department also have GIS sections. In term of data collection, arrangement and management, there should be good coordination among the departments. Accurate and detailed data would be helpful, supportive and effective for the whole VCDC.

- Laboratory
- For preparing a laboratory, chemicals and equipment should be prioritized toward a standard laboratory. To gain sustainability, chemicals and equipment must be able to be purchased by YCDC in the future in terms of budget and procurement route.

## 5. Recommendations and Conclusions

The following recommendations and conclusions have been adopted as an important policy of DEWS in the meeting.

- (1) New organization structure
- Mid-long term targets (future ideal image) and achievement state of the Project will be prepared for all other new sections
- New sections and division should be adapted and functionalized in the entire organization of EDWS.
- New organization structure will be reviewed and finalized, and a process to obtain approval from necessary authority will start.
- (2) Sustainable management style suitable for Myanmar will be continuously studied
- Preparation will be started toward independent and financially self-sufficient utility in future
- (3) NRW management is set as a top priority in the policies of EDWS and implementation of NRW reduction measures is facilitated.
- (4) Water quality improvement in treatment plant and direct supply of reservoir water is facilitated.

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### 6. Modification of Schedule of PO

Based on the delay of pilot project for NRW management, the revised schedule of PO as version 2 has been set as shown in Annex-1.

# 7. Process for modification of PDM and PO

It was confirmed that the modification of PDM requires amendment of R/D but the modification of only PO does not require amendment of R/D. In this time, PDM was not modified but only PO was. Therefore, modification of R/D is not required in this time. (End)

Annex-1: Plan of Operation (PO) version 2 (Modified Schedule)

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The Project for Improvement of Water Supply Management of YCDC Plan of Operation (PO) ver. 2

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I-5 Formulate regulations, standards and guidelines		Ì									2		Team1-2,	
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1-0-2 sustainable operation of water supply service to		t	Ì								1			-
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1-8-3 Conduct trainings of trainers for planning and organizing th		-									:			-
4. A. Develop Sytem and 10-year human resources developmen	-	t	T					1	1		T			-
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1-9-2 Launch priority activities as a part of implementing the 5-		Ē									Π			-

PO Act	vity Ho.	2015		Phate	2016	Schedule	2017	2017 20	Prase 2	019 202	Responsible	e Expert/YCDC mization	Collaborators
Output	1. Capacity of YCDC on NRW management is improved.	Jui-See 0	1-000	lan Mar Acrilia	44.500	001-000	Jan-Mar				data	YCOC	
2-1	Establish NRW Management Unit 2414 - Establish NRW Manasement Likit	-		-					+	-	CA, NRW	Team2	
	2-1-2 Define the division of duties of NRW Management Unk	-									NBW	Tann2.	
22	Collect and complex information of NRW 2/2-1 Collect information of NRW and implement a baseline	-		-			İ					Proposed NRW Management	
	2.2.2 Complia information of pipes for establishment of GiS 2.2.3 Complia information into database		t				Î						
	2-2-4 Formulate Standard Operation Procedure (SOP) of the above information management Develop a model on the management of physical loss (eashage, over			-				+	╟	t	NRW(PL)	Tean2, Yarkin	
3	Row) and human resources development 2-3-1, Review current struation and develop phased	-	╢	+			I	+	T	-		Township, Proposed NRW Management	
	2-3-2 Conduct trainings of trainers								╉	╈	1		
	2-3-3 Prepare training plan and training materials by the trainers 2-3-4 Formulate manuals on obscinal loss							-	h	1	-		
	2:3-5 Conduct Off-JT by the trainers		-							t	1		
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	event survey and repeat for an event of the plot area		$\left  \right $								• ] :		
	2-3-8 Set up DMAs at the pilot area (including procure materials and construct DMA)		Ħ		H		Π		H	H			
	2.5.0 Conduct the countermeasures against physical tots in the				-			+	T		_		
	pata area Presulate cost-benefit of countermeasures against physical 2:3-10 feas of the pick area and formulate the optimul model of	-							Т		_		
	activities 2-3-11 Implement OJT by the trainers								₽	l			
	2-3-12 Verify the manuals on physical loss								₽	l	The second se	Trand Visit	
24	Develop a model on the management of commercial (non-physical) bos (meler fault, mess reading of meler, lilegal connection) and human resources development								-		MKAN(NO-T)	Townsho, Tanun Townsho, Proposed NRW	
	2-4-1 Review current situation and develop phased								T		-	Management Section	
	2-4-2 Conduct trainings of trainers								h				
	2-4-3 Prepare training plan and training materials by the trainers					4		-	h	1	_		
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	Prepare action plan and procurement of equipment for the								-		_		
	2-4-6 countermeasures to be taken for commercial lots in the selected plot area	-	t					1	-			_	
	2-4-7 Conduct the countermeasures against commercial loss in 2-4-7 Pig. pflor, area				-				n				
	2-dual brace solutions and formulate the optimal model of additional brace in the pilot area and formulate the optimal model of additional								T		-		
	2-4-9 Implement OUT by the trainers in the plot area		1						₩	Ħİ		1	
2.6	2-4-10. Verify the manuals on commercial loss Develop and succost implementation of the MRW management clans							1	┢	t	CA. NRW	Team2,	
	2-5-1 Develop 5-year and 10-year NRW management plans							ł	h		-	Management Section	
	2-5-2 Launch priority activities as a part of implementing the 5-								L	T			
Output	3. Capacity of YCDC on water quality management is improved.		1	-				-	-				
12	Establish Water Treatment Section	-									GA, DCAPlen, FBM, New exp	Team 1-3, art Team 2	
	3-1-1. Establish the Water Troatment Section in Department of Water and Serthation.												
	3-1-2 Define the division of dubies of the Water Treatment Section 										1:		
3.2	Review current situation and formulate phased countermosures										WOW OBM	Toarn3	
3	Conduct training of trainers on water quarky management Conduct training of trainers on the water cuality.								-		WOW OW	Water Quality Montoring Section, Water	
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ž	Develop SOP for water quality management				_			+	1		WOW OSM	Water Quality Monitoring Section, Water	
	3-4-1 Develop SOP on water quality test and monitoring Develop SOP on operation and maintenance of water								П		-	Reservoir Division	
3.5	3-4-2. Insumment plant & deinfection facility Contour OUT on well equally management at the plot treatment internation distributions facilities.			-							WOM, OBM	Water Quality Monitoring	
	parts and conversion of a subsystem and water quality 3-6-1 management equipment						-					Section, Water Reservoir	
	3-5-2 Conduct OUT on water quality test and monitoring Descende Biochon of Interferent Intervention		1	1					H	l		Line of the line o	
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3.7	3.6.2 Research water quality indication measure of reservoir Develop and support indication of the water quality									1	CA, WOM, OS	M Water Quality	
	mainagenerit pains 3-7-1 Develop 5-year and 10-year water quality management								T		-	Section, Water Reservoir	
1.10	3-7-2 Laurch priority activities as a part of implementy urgest water quality management plan				4	-	A	V		A A			
Kick-o	T Meetings, JCC, or other meetings	Nick-off		JOC -	100		DOL	1		1.	1		

: Addition of activities in PO Version 2 . New schedule in PO Version 2

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MINUTE	ES OF MEETING	Attachment: Main noints discussed and decided
OF THE THIRD JOINT (	COORDINATING COMMITTEE	
	FOR	1. Progress of the Project
"The Project for Improvement o	of Water Supply Management of YCDC"	It was confirmed by all participants that implementation of previous recommendations and conclusions made in the 1st and 2nd TCC are in more and 8-with editors to 1000 and 2000 and 2000 and 2000 and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are in the 1st and 2000 are in more and 8-with editors to 1000 are
Based on the Record of Discussions (R/D)	) on the Project for Improvement of Water Supply	required. In general, the progresses of the Project are on the track but for the following matters
Management of YCDC (hereinafter referred	d to as "the Project") signed on 25th November 2014	further implementation by YCDC were found necessary through the discussions.
between Yangon City Development Commi-	ittee (hereinafter referred as "YCDC") and the Japan	1.1 New organization structure is to be reviewed for more efficient and effective management
International Cooperation Agency (hereinal	fter referred to as "JICA"), JICA has dispatched the	1.2 NRW management is set as top priority in the policies of EDWS and implementation of
Expert Team to Myanmar for implementation	ion of the Project since 4 <sup>th</sup> July 2015.	NRW rèduction measures is facilitated.
The 3rd meeting of the Joint Coordinating C	Committee (hereinafter referred to as "JCC") for the	2. Additional activities proposed by Myanmar side
Project chaired by the Secretary of YCDC w	vas held on 1 <sup>st</sup> February, 2017, after the 2 <sup>nd</sup> Myanmar	EDWS proposed the following additional activities in future activities of the Project to JICA.
Japan Joint Seminar on 30th January to 1	<sup>1st</sup> February 2017, The JICA Advisory Committee	JICA will further consider them in Japan and decision will be informed to EDWS.
members headed by Mr. Koji Nakashima, J	IICA, participated both in the Seminar and ICC.	2.1 Construction of training yard of non-revenue water (NRW) management and
		implementation of training
The following agenda was discussed amoni	g the participants of the JCC meeting including the	· EDWS has suggested the necessity of a training yard. The training yard for NRW
counterparts of Engineering Department (	(Water and Sanitation) (hereinafter referred to as	management will be utilized to train the persons related with NRW management such
"EDWS") of YCDC, JICA, JICA Advisory	Committee, and JICA Expert Team.	as YCDC staff members, private contractors and plumbers. The training yard will
1. Review of previous recommendations	s and conclusions in the 1 <sup>st</sup> and 2 <sup>nd</sup> JCC	enable YCDC to train appropriate skills on NRW management measures periodically
2. Recommendations prepared in 2nd My	yanmar Japan Joint Seminar	and in a short time and train numbers of skilled personals necessary for NRW
3. Progress of project covering the perio	od from September 2016 to January 2017	management. EDWS will construct the training building by its own budget and
4. Proposal from YCDC for the future A	Activities	requests JICA to design the yard and procure necessary equipment and materials to be
		procured from the outside of Myanmar. Training yard will be managed by the Human
In the course of discussions, main point	is discussed and decided are summarized in the	Resource Development Section and training of trainers (ToT) will be made by NRW
attachment.		Management Section and concerned Sections such as Design Section. This yard will
		be constructed as a part of future EDWS training center.
	Yangon, 16th February, 2017	2.2 Water meter related activities
		BDWS has understood that water meter related activities are one of the most important
1 1 1 1 1 X	الحرال	activities to ensure sufficient revenue collection. EDWS requested JICA to assist
12 11 10 10 18		following activities to establish a sufficient water meter system. The activities include
Mr. Hirotaka Sato	Daw May May Thwe	assistance for analysis and survey of water meter status and establishment of the
Chief Advisor	Committee Member	regulations and standards related to water meter such as responsibilities, material
The Project for Improvement of Water	Yangon City Development Committee	selection, meter accuracy check, and replacement policy. These activities will be led
Supply Management of YCDC	(YCDC),	by full time counterparts of NRW Management Section.
	The Republic of the Union of Myanmar	2.3 Customer Service Department related activities including computerized database system
		for billing and collection
÷		In the financial point of view, revenue collection is one of the most important functions
		of EDWS. The current practice of revenue collection is mainly implemented by

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- Section to lead improvement of T/S working process as well as managing field since it is established for the first time in Myanmar. EDWS requested JICA to villing/revenue collection system. EDWS does not have enough experience on this (T/S) offices, it is important for newly established Customer Service Management support this activity.
- 2.4 NRW management pilot project in North Okkalapa
- already acquired by EDWS and the project is planned to start from May, 2017. EDWS technologies and skills through OJT and develop trainers by repeated practice of EDWS has decided to implement NRW management pilot project in North Okkalapa by its own budget to accelerate NRW reduction in the City. The budget has been requested JICA to support this activity to firmly establish proper NRW management Yankin Pilot project for NRW management assisted by JICA expert.
  - 2.5 Continuous assistance for water quality management activities
- The following activities were added in the 1st JCC held on January 2016, for improvement of water quality in the water treatment plant and are now in progress. Continuous assistance for these activities is required. .
  - > Diagnose function of treatment processes of Nyaunghnapin water treatment plant by March 2018.
- Develop improvement measures of function of Nyaunghnapin water treatment plant through pilot basin by March 2019.
- Prepare an improvement plan of Nyaunghnapin water treatment plant by June 2019.
- Furthermore, the following activities also were added to improve water quality of In addition, to implement these pilot activities, procurement of filter materials (anthracite and sand) and equipment like flow meters and dryers are required. EDWS direct water supply to the citizen. Continuous assistance for these activities is will procure the materials and EDWS requests JICA to procure necessary equipment. .
- Conduct OJT on improvement of water quality supplied from reservoirs

required.

- ♦ Review water quality problems in reservoir water
- Research water quality improvement measure of reservoir suppled water Water quality analysis based on National Standard Method
- Water Quality & Monitoring Section has established Water Quality Monitoring Plan and water quality analysis in terms of the priority items should be made based on . 2.6

Myanmar National Drinking Water Quality Standard, 2014. Standard methods of

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water quality analysis should be adopted before 2020 according to the National Standard. EDWS needs assistance of the capacity to analyse water quality using standard methods. EDWS plans to procure flame atomic absorption spectrometry and would appreciate JICA to assist other equipment such as UV-vis absorption spectrophotometer along with assistance of enhancement of testing capacity. 2.7 Preparation of water supply ordinance

- EDWS has learned, in Japan, each municipal water supply utility has its own Water Supply Ordinance, which stipulates responsibility, rights and duties of water supplier and its customers. EDWS lacks this fundamental law and regulation to carry out the duties of water supply utilities. With this ordinance, all duties of EDWS will be performed more efficient and effective. EDWS will prepare this ordinance and assistance and advise by JICA expert to make and test the prepared ordinance according to experience in Japan will be appreciated.
  - 2.8 Water resource management and conservation
- on reservoir water. In future, river water sources will be also introduced as additional water resources. Water resources are very important for water supply system, and to At present, water resources for Yangon City Water Supply System mainly depends manage and preserve water resources sustainably is one of the main responsibilities of EDWS. Currently, EDWS is monitoring the reservoirs by measuring rainfall and reservoir water level, and also planning to measure the required meteorological and hydrological data for the analysis. BDWS also needs to formulate Water Resources Management Plan and Water Resources Conservation Plan. EDWS urgently needs to prepare Laws and Regulations for water resources conservation and also needs to propose these to the regional and national level for the confirmation. To carry out these activities efficiently, EDWS would like to request the assistance of JJCA expert who has well experiences for the water resources management & conservation.

3. Recommendations and Conclusions

(1) BDWS should study more of the contents presented by Advisory Committee in the 2<sup>nd</sup> Joint Following recommendations and conclusions were presented by Head of BDWS.

- Seminar and implement recommendations to achieve the visions. 3
- (3) Organization structure of EDWS should be reviewed to achieve a more efficient structure Sustainable management style that suits EDWS should be continuously studied.
  - and shall be authorised officially by YCDC and Regional Government. (4) 3 Steering Committees are officially established.

    - Regulations, Standards, Guidelines and Manuals Planning and Monitoring, and Kaizen (5S+7W)
      - Non-revenue water (NRW) management
- (5) Recommendations prepared in 2<sup>nd</sup> Joint Workshop were adopted as priority activities of

EDWS.

- Prioritized activities of the plans and rules set in the recommendations at the 2<sup>nd</sup> Joint Seminar will be prepared and implemented under initiative of the abovementioned three steering committees.
  - EDWS understands the importance that all duties of EDWS should be implemented based on a fundamental regulation, Water Supply Ordinance, and EDWS will start preparing the Ordinance.
- (6) NRW management is set as top priority in the policies of EDWS and implementation of NRW reduction measures is facilitated.
  - (7) Water quality improvement in water treatment plant and direct supply of reservoir water shall be facilitated.

(End)

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### OF THE FOURTH JOINT COORDINATING COMMITTEE MINUTES OF MEETING FOR

"The Project for Improvement of Water Supply Management of YCDC"

Management of YCDC (hereinafter referred to as "the Project") signed on 25th November 2014 between Yangon City Development Committee (hereinafter referred as "YCDC") and the Japan Based on the Record of Discussions (R/D) on the Project for Improvement of Water Supply International Cooperation Agency (hereinafter referred to as "JICA"), JICA has dispatched the Expert Team to Myanmar for implementation of the Project since 4th July 2015. The 4th meeting of the Joint Coordinating Committee (hereinafter referred to as "JCC") for the Project chaired by the Secretary of YCDC was held on 7th September, 2017. The following agenda was presented and discussed among the JCC participants including YCDC counterparts, JICA, and JICA Expert Team.

- Review of previous recommendations and progress
- Work Plan of Term 2
- Progress of project, issues to be shared, and discussion
  - Concept of good Governance/ sustainable utility
- Management Improvement Plan
- Mid-Term Management Policies 6
- Declaration of Steering Committee 1
  - Conclusions and recommendations

In the course of discussions, it was confirmed by both sides that the progress of the Project is on the management pilot project and their related activities. The contents of meeting were given in track except procurement of materials and equipment of flow monitoring system and NRW Appendix and Modified PO (Version 4) is given in Annex-1 as r result of meeting.

Yangon, 15<sup>th</sup> September, 2017

H New York Mr. Hirotaka Sato X BY for

The Project for Improvement of Water Supply Management of YCDC Chief Advisor

Daw May May Thwe idje.

Yangon City Development Committee Committee Member YCDC),

The Republic of the Union of Myanmar

Attachment: Main points discussed

The current progress of recommendations and conclusions adopted in the 1st, 2nd and 3rd JCCs were reviewed and confirmed to follow up Engineering Department of Water and Sanitation (EDWS) 1. Review of Recommendations and Conclusions of previous JCCs  $(1^{st}, 2^{nd} \text{ and } 3^{nl})$ continuously.

# 2. Procurement of Materials and Equipment

The current status of procurement of equipment was presented by the JICA expert and future schedule is set as follows.

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	Equipment	Expected delivery timing in Monitoring Sheet 2	Current progress of procurement Tender documents are now	Updated expected delivery timing in Monitoring Sheet 3 Around August 2018
_	Flow monitoring system	May 2017 including installation	under preparation JICA HQ.	including installation (tentative)
	NRW management (leakage repair and detection and DMA construction)	March 2017	Tender documents are now under preparation JICA HQ.	May 2018 (tentative)

### 3. Recommendations and Conclusions

The following recommendations and conclusions have been adopted as an important policy of DEWS in the meeting.

A) NRW Management

- 1. Pilot Project in Yankin for NRW Management
- Request JICA to expedite procurement of materials and equipment
- Need rescheduling NRW management activities of Yankin pilot project
- 2. Training yards for NRW Management
- Start immediately the design and construction work
- Request JICA to start procurement of materials and equipment
  - B) Toward Good Governance and Sustainable Utility
- 1. Steering Committees
- Actively participate in S/Cs, find improvement measures, share them in EDWS, establish an unified operation system for more efficient operation and service
  - 2. RGSM (Regulations, Guidelines, Standards and Manulas)
- · Prepare a road map for developing and enforcing of RGSM, including priority items and scheduling
- 3. Management Improvement Plan
- · Finalize MIP to strengthen Governance and aim for future ideal organization
Include activities for MIP in mid-term plan and monitor the progress of implement MIP

4. Mid-Term Plan

- To achieve our missions and M/P, strategic plans will be continuously prepared, implemented, evaluated and improvement measures, and create PDCA cycle
   Using PDCA cycle, to establish a good business spiral for sustainable organization
- For management, accurate data and performance indicators (PIs) are of the most
  - ron management, accurate data and performance moneators (ris) are or use minportance. Establish accurate and efficient data management system
- We set up mid-term important management policies. Focusing on policies, we have to work to achieve for mid-term goals.

## 4. Comments on Head of Department (CE)

CE will deliver today's main theme: Management Improvement Plan (MIP) including good governance and the progress & improvement between 3rd and 4th JCC, to Secretary and Committee Member. CE satisfies today's all presentations and could see the improvement throughout all presentations but we also need to implement those in real. JICA Expert Team will support 5 years and has been supporting over two years. During the rest three years, CE recommends all officers and staffs of EDWS to try to catch up and gain the technology, management system and the experience from the JICA Experts as much as possible in order to be able to stand efficiently at the end of the Project.

## 5. Modification of Schedule of PO

Based on the delay of the procurement of materials and equipment of flow monitoring system and NRW reduction in pilot project, the revised schedule of PO as version 4 is as shown in Annex-1.

# 6. Process for modification of PDM and PO

It was confirmed that the modification of PDM requires amendment of R/D but the modification of only PO does not require amendment of R/D. In this time, PDM was not modified but only PO was. Therefore, modification of R/D is not required in this time. (End)

Annex-1: Plan of Operation (PO) Version 4 (Modified Schedule) with schedule of the previous Version.

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### Annex-1: PO Version 4 (Modified Schedule)

PO Version 3 --- Version 4 The Dision for Innovament of Weter Sumply Managem

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nt 3	Capacity of YCDC on NRW management is improved.	
w	ktablish NRW Management Unit	
	2-1-1 Establish NRW Management Unit	
1.00	C-1-2 Define the division of duties of NRW Management Unit	
U	ollect and compile information of NRW	
	2-2-1 Collect information of NRW and implement a baseline survey	
100	:-2.2 Compile Information of pipes for establishment of GIS	
100	2.2.3 Compile outloner information into database	
10	2.2.4 Formular Sandarg Uperation Processive (SUP) of the above Information management	
5 6	retrop a model on the management of prysical loss (reavage, over riuw) Id human resources development	
-41	2.3.1 Review current struttion and develop phased countermeasures	
	2-2-2 Conduct trainings of trainers	
	Conduct trainings of trainers through implementation of Non- revenue water (NRVk) pilot project in North Okkalapa	
	2-3-3. Prepare training plan and training materials by the trainers	
-	2-3-4 Formulate manuals on physical loss	
-	2-3-5 Conduct Off-JT by the trainers	
100	b-3-6 Select a pilot areas for NRW management activities	
-	Prepare action plan and procurement of equipment (reekage 2-3-7 auring and repair) for the countermeasure to be taken for	
1	Programmer and the programmer Set up DMAs at the pilot area (Including procure materials and	
1	Construct DMAy Conduct the countermeasures against physical loss in the plict	
1.7	area Evaluate cost-benefit of countermeasures against physical loss of	
-	-3-10 the pilot area and formulate the optimal model of activities	
- 1	-3-11 Implement OJT by the trainers	
	-3-12. Verify the manuals on physical loss	
122	or each a mader and rear mangament or connection with private root heter fould, miss reacting of meter, illegal connection) and human cources development	
-	2-4-1 Review current situation and develop phased countermeasures	
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	2-4-5. Conduct Off-JT by the trainers Development of the stant and recoverement of evolutionant for the	
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	2-4-7 Conduct the countermeasures against commercial loss in the	
-	2-4-8 Evaluate cost-benefit of countermeasures against physical loss in 2-4-8 the pilot area and formulate the contrast model of activities.	
	2-4-9 Implement OJT by the trainers in the pilot area	
-	b-t-10. Verify the manuals on commercial loss	
10	evelop training yard for NRW management	
-	2-5-1 Prepare training plain for training yard	1
-	2:52 Design training yard	1
	2-5-3 Prepare equipment and materials for baining yard	
	2-5-4 Construct training yard	
-	2-5-5 Propare training of the training yard and conduct trainings of the training yard	
-	2-5-6 Conduct Off-JT by the trainers in training yard	
-	evelop and support implementation of the NRW management plans	
	3-6-1 Pavolovi Kunar and 10-vear NRW management plans	
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state       state <t< td=""><td></td><td>S-1-2. Define the division of duties of the Water Treatment Section</td><td></td><td>I</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		S-1-2. Define the division of duties of the Water Treatment Section		I								
		3-1-3 Hold a series of seminar for basic water (reatment technology that study fours in treatment facilities		:					-			
	3-2	Review current situation and formulate phased countermeasures						-		_		
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3ry         Direction and support implementation of the work quality memogrammed            5/1.1. Develop 5-prior and to your works:         5/1.1. Develop 5-prior and to your works:            5/1.2. Lowardy 5-prior and to your works:              5/1.2. Lowardy 5-prior and to your works:               5/1.2. Lowardy 5-prior and to your works:                5/1.2. Lowardy 5-prior and to your works:                 5/1.2. Lowardy 5-prior and to your works: </td <td></td> <td>2.6.2 suppled water quality improvement measure of reservoir</td> <td></td>		2.6.2 suppled water quality improvement measure of reservoir										
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Not-wet Newsings, JCC, or other meetings $\Delta$ $\Delta$ $\Delta$ $\Delta$ $\Delta$ $\Delta$ $\Delta$ $\Delta$ $\Delta$ $\Delta$		3-7-2 Launch priority activities as a part of implementing 5-year water 3-7-2 quality management plan										
	Nick-of	Meetings, JCC, or other meetings	A Nick-off	\ CC1	JCC2		48	∆ 7 JCC5 JC	100	A JCC7	∆ JCC8	A Loca

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MINUTE	S OF MEETING	Attachment: Main points discussed and decided
OF THE THIRD JOINT C	COORDINATING COMMITTEE FOR	1. Progress of the Project
"The Project for Improvement of	f Water Supply Management of YCDC"	It was confirmed by all participants that implementation of previous recommendations and conclusions made in the past four JCC meetings are in progress and facilitation by JICA experts
Based on the Record of Discussions (R/D) Management of YCDC (hereinafter referred between Yangon City Development Commit International Cooperation Agency (hereinaft Expert Team to Myanmar for implementatio	• on the Project for Improvement of Water Supply to as "the Project") signed on 25th November 2014 ttee (hereinafter referred as "YCDC") and the Japan tter referred to as "JICA"), JICA has dispatched the an of the Project since 4 <sup>th</sup> July 2015.	is further required. In general, the progresses of the Project are on the track but for the following matters were found to require further following-up. 1.1. EDWS will continue reviewing new organization structure for more efficient and effective management responding to the progress of the entire YCDC restructure, and assigning full-time staff to the sections which need to be strengthened. 1.2. JICA wll make necessary arrangement to accelerate the procurement procedures of the
The 5th meeting of the Joint Coordinating C Project chaired by the Secretary of YCDC w	committee (hereinafter referred to as "JCC") for the vas held on 26 <sup>th</sup> February 2018.	equipment for the pilot project of non-revenue water management. 2. Modifications of OVIs in PDM
The following agenda was presented and dii including the counterparts of Engineering referred to as "EDWS") of YCDC, JICA My 1. Review of previous recommendations 2. Progress of the Project	scussed among the participants of the JCC meeting t Department (Water and Sanitation) (bereinafter yammar Office and JICA Expert Team. and conclusions	Both sides in principle agreed to modify the required Objectively Verifiable Indicators (OVIs) in the Project Design Matrix (PDM) after OVIs and their structure were reviewed and OVIs system was restructured with setting their values, by which achievement of Outputs and Project Purpose would develop continuous impact on improvement of water supply service and lead to achievement of Overall Goal. The concerts of the modification are as follows:
<ol> <li>Revision of objectively verifiable indi</li> <li>New customer database</li> <li>Steering Committee (S/C) activities in</li> </ol>	icators in project design matrix (PDM) ncluding improvement action plans on-going	2.1. Overall Goal: Overall Goal will be achieved 3 to 5 years after the completion of the Project by implementing a Plan-Do-Check Action (PDCA) cycle utilizing the capacity developed through achieving Project Purposes and Outputs. The OVIs which have not
In the course of discussions, main point attachment.	s discussed and decided are summarized in the	been specified yet will be set in the 4" year of the Project. 2.2. Project Purpose: Project Purpose was reviewed to be composed by the aspects of "development and operation of a monitoring system", "establishment of a periodical immovement system" and "development of a mid-term alan and other alans to achieve
は振水芥	Yangon, 22 <sup>nd</sup> March 2018	Overall Goal". OVIs were set to confirm the degree of the achievement from the view of those aspects in each field. 2.3. Output: Outputs were reviewed to be composed by the aspects of "establishment of
Mr. Ilirotaka Sato Chief Advisor The Project for Improvement of Water Supply Management of YCDC	U Aung San Win Head of Department, Department of Engineering (Water and Sanitation), Yangon City Development Committee (YCDC), The Republic of the Union of Myanmar	<ul> <li>responsible organizations', 'unprovement/establishment of internal process', and "development of leaders, managers, technical professionals, and trainers' for the activities to achieve Project Purpose and Overall Goal'. OVIs were set to confirm the degree of the achievement from the view of those aspects in each field.</li> <li>2.4. OVIs: The restructured OVIs sorted by Output were drafted as shown below. After further discussion on the detail modifications, the PDM will be finally revised by the amendment of the signed R/D signed on 25th November 2014 between YCDC and JICA. The comparisons with the previous version and their reasons were described in Appendix -1,</li> </ul>
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Overall Goal	Water supply services provided	I by YCDC are enhanced.		3.2. NRW Training Yard
	Output J The management key performance indicators (MKPIs) are improved	Output 2 NRW is decreased from OO % to OO % in the water supply area of YCDC.	Output 3 The compliance ratio in terms of turbidity to meet the water quality standard is increased	Concerning the construction of training yard for NRW was requested by EDWS in the 4 <sup>th</sup> JC Meeting, EDWS explained about its location of construction, facilities built and training
	compared to use data at me Project commencement.		room 00% to 00% 1 he compliance ratio is increased of residual chlorine (>0,2 ma0).	courses for which the Training Yard would be utilized. The expense distribution f construction of the Training Yard between both sides were confirmed as below. EDWS mac request that JICA will accelerate procurement of equipment so as not to affect the construction
Project Purpose	Capacity of VCDC on the mans	agement of water supply service is	s improved.	spinora and a second second second second second second second second second second second second second second
<ul> <li>Monitoring system in operation</li> </ul>	The implementation of mid- term management plan is monitored based on MKPls.	The NRW ratio is grasped in the water supply service area of YCDC and monitored.	Water quality is grasped in the water supply service area of YCDC and monitored.	schooute, YCDC: Civil work, building, storage tank, pump and other necessary work
<ul> <li>Development of periodical</li> </ul>	Steering Committees (S/C) are or	rganized and improvement actions a	are împlemented.	JICA: Equipment and tools for training
improvement system	S/C2	1 S/CI	S/C2.3	
Development of Mid-term plan Outputs	Mid-term management plan is approved by EDWS,	Plan for NRW reduction is approved by EDWS.	Plan for improvement of water quality is approved by EDWS.	4. Additional Request from EDWS EDWS explained that there is an idea to construct new training centre. for which EDW
Responsible     organizations are     established	1-f New organization structure is approved by Mayor.			requested JICA to make quick support in terms of its cost, materials, or equipment.
<ul> <li>Internal process are improved or</li> </ul>	1-3 Drafts of regulations, standar	rds and guidelines for water supply s	services in Yangon is approved	5 Becommendations and Conclusions
retablished of	1.2 Plan for himan resources day	Comparison is a manual build b	1	3. Accountentations and Concussions
cstablished	1-2 Plan for human resources dev 1-1 Plan for improvement of	velopment is approved by EDWS. 2-1 Manuals and training	3-1 Manuals and training	Following recommendations and conclusions were presented by Head of EDWS.
	water bill collection is approved by EDWS.	materials are utilized by YCDC staff.	materials are utilized by YCDC staff.	5.1. Planning Section should develop its capacity to implement a PDCA cycle, with which
		2-2 Information of customers	3-2 Result of the water quality	EDWS will establish PDCA cycle of respective plans of EDWS and the Project.
		compiled and updated.	and on-site mini laboratory is	5.2. Responsible offices/sections should formulate and implement the Improvement Plan
		2-5 NRW ratio is decreased to 25% in the pilot area.	recorded and monitored periodically.	Action Plans listed below, which Steering Committee should supervise the progress ar
			3-5 The turbidity of treated	facilitate necessary actions.
			Water in plot suid filter in Nyaunghrapin water treatment	Re-organization Plan
			plant is controlled less than 1 NTU.	<ul> <li>Management Improvement Plan/SS Kaizen Plan</li> </ul>
			3-6 The operation and	Mid-term Management Plan
			Lagunbyin water reatment	Bill Collection Improvement Plan
			plant is prepared. 3-7 The operation and	Public Awareness Plan
			maintenance system of chlorination facilities is	HRD Plan
• Leaders, managers,	1-5 2 full time staff members in	2-3 The number of trainers for	prepared. 3-3 The number of trainers for	NRW Management Action Plan
technical	Planning Section can give	NRW management becomes 8.	water quality management	<ul> <li>Water Quality (WQ) Improvement Plan</li> </ul>
proressionars, and trainers are	EDWS staff.	training based on training plan	a-4 EDWS staff participates in	5.3. For the formulation of Water Supply Regulation, the roadmap and its detail schedu
developed		for NRW management.	training based on training plan for water quality management.	should be set and implemented so that concrete outcomes could be promptly materialize
				5.4. The working schedule of introducing New Customer Database should be managed base
3. Agreements fo	or the upcoming activities	8		on a roadmap to achieve the target.
3.1. New Custome	er Database			5.5. EDWS will continue reviewing new organization structure for more efficient ar
The introduction of	f new customer database s	ystem of EDWS, develope	ed separately from the	effective management responding to the progress of the entire YCDC restructure, an
existing e-Governm	tent system managed by th	he Administration Departm	tent, was agreed, with	assigning full-time staff to the sections which need to be strengthened.
which billing and e	ollection works can be cor	mputerized. EDWS confirm	ned to bear the cost of	5.6. JICA will make necessary arrangement to accelerate the procurement procedures of th
the system developi	ment and maintenance. The	e EDWS made request for	additional assignment	equipment for the pilot project for non-revenue water management.
of the Expert for sul	pporting procedures to lau	inch the new system.		

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<ol> <li>Concept of Revision of PDM from Version 2 to Version 3 Required OVIs and their structure are reviewed and OVIs system is restructured with setting their</li> </ol>	values, by which achievement of Outputs and Project Purpose would develop continuous impact on improvement of water supply service and lead to achievement of Overall Goal.	(1) Method for achieving Overall Goals The Overall Goal is to be achieved within 3 to 5 years after the completion of the Project by implementing a Plan-Do-Check-Action (PDCA) cycle utilizing the capacity developed through achieving Project Purposes and Outputs.	<ul> <li>(a) tayles and operate a multioring system of MKPIs</li> <li>Achieve all Ourputs</li> <li>Develop and operate a multioring system of MKPIs</li> <li>Testabilish a periodical improvement system</li> <li>Estabilish a periodical improvement system</li> <li>Boelop Mid-term plans to achieve the Overall Goal</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle to achieve Overall goal</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>What and how many years are required in operating in PDCA cycle?</li> <li>Towelop functions for the activities to achieve Project Purposes and Overall Goal are improved on established.</li> <li>Reorganizations</li> <li>Reorganization</li> <li>Reorganization</li> <li>Reorganization of regulations, standards, guidelines, SOPs, and manuals and improvement of work processes</li> <li>Internal process for the activities to achieve Project Purpose and Overall Goal are improved on established.</li> <li>Established.</li> <li>Established.</li> <li>Established.</li> <li>Povelopment of regulations, standards, guidelines, SOPs, and manuals and improvement of work processes</li> <li>Dovelopment of leaders, managers, technicel professionals, and continuous human resource development colects, managers, technicel professionals, and continuous improved individuals with leaders, managers, technicel professionals, and trainers</li> </ul>	(ئ ب رو
	FOR IMPROVEMENT OF MANAGEMENT OF YCDC TERM 2	. Matrix (PDM) in terms of Objectively Verifiable licators (OVIs) 26th Pab. 2018 JICA Expert Team	2 to Version 3	<i>H</i>
Appendix-1	THE PROJECT] WATER SUPPLY	Concept of Revision of Project Design   Indi	<ol> <li>Concept of Revision of PDM from Version.</li> <li>Image of Concept to Achieve Overall Goals</li> <li>Required OVIs in Project Purposes and Oui</li> <li>Reting Values of OVIs in Version 3</li></ol>	Ŀ

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 Image of Concept to Achieve Overall Goals PDCA Cycle will be managed and coordinated by Planning Section.



3. Required OVIs in Project Purposes and Outputs by OVIs of Overall Goals in the Project in

Overall Goal	Water supply services provided	by YCDC are enhanced.	Outmut
	Output 1 The management key performance indicators (MKDB) are improved compared to the data at the Project commencement.	Output 2 NRW is decreased from x5% to x5% in the water supply area of YCDC.	Out of turbidity to of turbidity to quality standar from O0% to compliance tal from O0% to of residual chi me/l).
Project Purpose	Capacity of YCDC on the mana	gement of water supply service is	s improved.
<ul> <li>Development of plans</li> </ul>	Mid-term management plan is approved by EDWS.	Plan for NRW reduction is annoved by EDWS.	Plan for improvo
Monitoring system in operation	The implementation of mid-term management plan is monitored based on MKPIs.	The NRW ratio is grasped in the water supply service area of YCDC and monitored.	Water supply se Water supply se YCDC and mo
<ul> <li>Development of periodical</li> </ul>	Stocring Committees (S/C) are or	ganized and improvement actions a	are implemented.
improvement system	SIC2	S/CI	S/C2, 3
Outputs - Responsible	1.4 New oroanization structure is	annoved by Mayor	
organizations are established		infinit to model	
<ul> <li>Internal process are improved or</li> </ul>	1-3 Drafts of regulations, standari by EDWS.	ds and guidelines for water supply :	services in Yango
established	1-2 Plan for human resources dev	elopment is approved by EDWS.	
	1-1 Plan for improvement of water bill oblication is approved by EDWS.	2-1 Manuals and training materials are utilized by YCDC staff. 2-2 Information of customers and pipes for the pilot areas is compiled and updated. 2-5 NRW ratio is decreased to <u>25</u> % in the pilot area.	<ol> <li>Maruals and marchils are till y GCDC starf.</li> <li>3-2 Result of the erroration of the and on-site minit recorded and more recorded and m</li></ol>
<ul> <li>Leaders, managers, technical</li> <li>professionals, and</li> </ul>	1-5 2 full time staff members in Planning Section can give direction of PDCA evelo to	2-3 The number of trainers for NRW management becomes 8. 2-4 FDWS staff participates in	3-3 The number of water quality man becomes 4
trainers are developed	EDWS stuff.	training based on training plan for NRW management.	3-4 EDWS staff training based of For water oughty

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4. Setting Values of OVIs in Version 3

Is Values/Note	Will be decided in 4 years after the si mid-term plan)	in Planning Section can give 2 professional staff (key persons in P section head or the equivalent level o will give the direction on PDCA to o will give the direction on PDCA to o township officers in Steering Connul this purpose, 2 professional full time required managing PDCA vycle as a	<ul> <li>NRW management becomes. B trainers (key persons in NRW Seed training to many staff, of EUNS on h including township staff, so that relating trainers are required. Following train to be developed. Trainers will be dev Management Section through North Yankin NRW pilot project, NRW raf , NRW general: 1 (Section head few , Physical Joss; 4</li> </ul>	<ul> <li>water quality management</li> <li>4 trainers (2 key persons in water quality mater treatment). The key persons in water treatment of and operation and maintenance) plant and their unuter is limited. For an water quality and 2 trainers on wa to be developed. The trainers will be developed. The training 1. Water quality analysis method 2. Water quality analysis method 3. Basic water treatment (O&amp;M) of Nyaung 4. Management (O&amp;M) of Nyaung 4.</li> </ul>	x96 in the pilot area. 25% Assuming Physical loss (20%) and complex will be replay will be remained, so the service pipes will be remained, so the 20%. All water meters will be replay.
0	Overall Goal	1-5 OD full time staff membe direction of PDCA cycle to E	2-3 The number of trainers fo 00.	3-3 The number of trainers fo becomes OO.	2-5 NRW ratio is dccreased to



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7. C	omparison	of OVIs	in PDM	Version 2 and	Version 3
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Narrative Summary	Version 2	Version 3	Reasons for modification
[Overall Goal]	1	and the second sec	and the second se
Water supply services, provided by YCDC are enhanced.	<ol> <li>The performance indicators (PIs) are improved compared to the data at the Project commencement.</li> <li>NRW is decreased from xx% to xx% in the water supply area of YCDC</li> <li>The ratio of water quality test results which satisfy water quality standards is increased from xx% to xx%.</li> </ol>	<ol> <li>The management key performance indicators (MKPIs) are improved compared to the data at the Project commencement.</li> <li>NRW is decreased from OO% to OO% in the water supply area of YCDC.</li> <li>The compliance ratio in terms of turbidity to meet the water quality standard is increased from OO% to OO%. The compliance ratio is increased from OO% to OO% in terms of residual chlorine (&gt;0.2 mg/h).</li> </ol>	<ol> <li>Management key performance indicators (MKPIs) in Mid-term Plan of EDWS have been prepared. These official Pls of EDWS are to be adopted as Pis for monitoring.</li> <li>No change</li> <li>Key water quality parameter for monitoring is specified. Turbletly and residual chlorine were chosen as these parameters are the main target parameters to be improved in the Project.</li> </ol>
[Project Purpose]		and the second sec	
Capacity of YCDC on the management of water supply service is improved.	<ol> <li>Evaluation of Pis is conducted periodically</li> <li>NRW is decreased from xx% to xx% in the plot area</li> <li>The ratio of water quality lest results which satisfy water quality standard is increased from xx% to xx%. in the pilot treatment plants.<sup>1</sup></li> <li>Note 1: The pilot water treatment plants will be existing Nyaunghnapin Water Treatment Plant under construction.</li> </ol>	<ol> <li>Steering Committees (S/C) are organized and improvement actions are implemented.</li> <li>Mid-lem management plan is approved by EDWS.</li> <li>The implementation of mid-term management plan is monitored based on MKPIs.</li> <li>The NRW ratio is grasped in the water supply service area of YCDC and monitored.</li> <li>Plan for NRW reduction is approved by EDWS.</li> <li>Water quality is grasped in the water supply service area of YCDC and monitored.</li> <li>Plan for improvement of water quality is approved by EDWS.</li> </ol>	<ul> <li>Version 2</li> <li>Modified to 1. and 3. in version 3 for more specific indicators.</li> <li>Moved to Output 2-5 in version 3.</li> <li>Moved to Output 2-5 in version 3 and modified considering the pilot project on going.</li> <li>Version 3</li> <li>Added to continue improvement action.</li> <li>1-1 in version 2 is moved here and name of plan is modified. The approval is required by EDWS.</li> <li>Added to continue improvement action.</li> <li>Added to continue improvement action.</li> <li>Added to continue improvement action.</li> <li>Added to continue improvement action on NRW management.</li> <li>2-4 in version 2 is moved here. The approval is required by EDWS.</li> <li>Added to continue improvement action on water quality management.</li> <li>3-4 in version 2 is moved here. The approval is required by EDWS.</li> </ul>

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### 6. Revised OVIs and equivalent Means of Verification in PDM Version 3

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	
[Overall Goal]			
Water supply services provided by YCDC are enhanced.	<ol> <li>The management key performance indicators (MKPIs) are improved compared to the data at the Project commencement.</li> <li>NRW is decreased from QQ % to OQ % in the water supply area of YCDC.</li> <li>The compliance ratio in terms of turbidity to meet the water quality standard is increased from QQ% to OQ%. The compliance ratio is increased from QQ% to OQ% in terms of residual chlorine (&gt;0.2 mg/l).</li> </ol>	<ol> <li>S/C2 activity record, MKPIs monitoring sheets</li> <li>S/C1 activity record, MKPIs monitoring sheets</li> <li>Water quality monitoring report, MKPIs monitoring sheets</li> </ol>	
[Project Purpose]			
Capacity of YCDC on the management of water supply service is improved.	<ol> <li>Sleering Committees (S/C) are organized and improvement actions are implemented.</li> <li>Mid-term management plan is approved by EDWS.</li> <li>The implementation of mid-term management plan is monitored based on MKPIs.</li> <li>The NRW ratio is grasped in the water supply service area of YCDC and monitored.</li> <li>Plan for NRW reduction is approved by EDWS.</li> <li>Water quality is grasped in the water supply service area of YCDC and monitored.</li> <li>Plan for improvement of water quality is approved by EDWS.</li> </ol>	S/C1, 2, 3 activity record     Approval of Mid-term management plan in S/C2     S/C2 activity record.     ANRW management report     ANRW management report     Approval of Plan for NRW reduction in S/C1     Aonthly water quality monitoring report     Approval of Plan for improvement of water quality in     S/C2	
[Outputs]			
<ol> <li>Capacity of YCDC on institutional management of water supply utility is improved.</li> </ol>	<ul> <li>1-1 Plan for improvement of water bill collection is approved by EDWS.</li> <li>1-2 Plan for human resources development is approved by EDWS.</li> <li>1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by EDWS.</li> <li>1-4 New organization structure is approved by Mayor.</li> <li>1-5 2 full time staff members in Planning Section can give direction of PDCA cycle to EDWS staff.</li> </ul>	<ul> <li>1-1 Approval in S/C2</li> <li>1-2 Approval in S/C2</li> <li>1-3 Approval in S/C3</li> <li>1-4 Approval letter or approval process confirmed by the Experts</li> <li>1-5 Evaluation based on duties in Management Planning Unit in Planning Section in Report on Institutional Reorgenization.</li> </ul>	
<ol> <li>Capacity of YCDC on NRW management is improved.</li> </ol>	<ul> <li>2-1 Manuals and training materials are utilized by YCDC staff.</li> <li>2-2 Information of customers and pipes for the pilot areas is compiled and updated.</li> <li>2-3 The number of trainers for NRW management becomes §.</li> <li>2-4 EDWS staff participates in training based on training plan for NRW management.</li> <li>2-5 NRW ratio is decreased to 25% in the pilot area.</li> </ul>	<ul> <li>2-1 S/C1 monitoring report, manuals in relevant offices, training record</li> <li>2-2 Rilot project activity report,</li> <li>2-3 HRD report (HRD Section)</li> <li>2-4 HRD report (HRD Section)</li> <li>2-5 Rilot project activity report.</li> </ul>	
<ol> <li>Capacity of YCDC on water quality management is improved</li> </ol>	<ul> <li>3-1 Manuals and training materials are utilized by YCDC staff.</li> <li>3-2 Result of the water quality test by the central laboratory and on-site mini laboratory is recorded and monitored periodically.</li> <li>3-3 The number of trainers for water quality management becomes 4.</li> <li>3-4 EDVVS staff participates in training based on training plan for water quality management.</li> <li>3-5 The turbidity of freated water in pilot sand filter in Nyaunghnapin water treatment plant is controlled less than 1 NTU.</li> <li>3-6 The operation and maintenance system of Lagunbyin water treatment plant is prepared.</li> </ul>	<ul> <li>3-1 S/C3 monitoring report, manuals in relevant offices, training record</li> <li>3-2 Water quality monitoring report,</li> <li>3-3 HRD report (HRD Section)</li> <li>3-4 HRD report (HRD Section)</li> <li>3-5 Activity report of Taskforce team</li> <li>3-6 Operation and maintenance organization structure of Lagunbyin water treatment plant</li> <li>3-7 Operation and maintenance organization structure of choirnation facilities</li> </ul>	

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MINUTES OF MEETING JOINT COORDINATING COMMITTEE FOR renet of Water Supply Management of YCDC" ons (R/D) on the Project for Improvement of Water filer referred to as "the Project") signed on 25th No elopment Committee (hereinafter referred as "YCDO tion Agency (hereinafter referred to as "JICA"), JI, Myanmar for implementation of the Project since dinating Committee (hereinafter referred to as "JCC") of YCDC was held on 10 <sup>th</sup> October 2018.		ängineering Department (Water and Sauitatio DC, JICA Myanmar Office and JICA Expert Tear ions and progress ions and progress teering Committees te to the end of the project ints discussed and decided are summarized i was prepared and is given in Attachment 2 as	Yangon, 16 <sup>th</sup> October, 2 U Aung San Win Head of Department, Department of Engineering (Water and Sanitation), Yang City Development Committee (YCDC), The Republic of the Union of Myanmar	
MINUTE OF THE SIXTH JOINT C "The Project for Improvement o	Based on the Record of Discussions (R/D) Management of YCDC (hereinalter referr 2014 between Yangon City Development the Japan International Cooperation Agen dispatched the Expert Team to Myanmar 2015. The 6 <sup>th</sup> meeting of the Joint Coordinating C Project chaired by the Secretary of YCDC v The following agenda was presented an	<ul> <li>meeting including the counterparts of F (hereinafter referred to as "EDWS") of YCI (hereinafter referred to as "EDWS") of YCI 1. Review of previous recommendat 2. Progress of the Project 3. Mid-term evaluation 4. Mid-term management plan 5. Progress and future schedule of S (progress, main issues and schedul nthe course of discussions, main poi Attachment 1. Monitoring Sheet Version 5 result of the meeting.</li> </ul>	In the North July A Mr. Hirotaka Sato Chief Advisor The Project for Improvement of Water Supply Management of YCDC	
[Outputs] Capacity of YCDC on institutional management of water supply utility is improved. 1-2 Plan for human resources development is approved by Yangon Region Government. 1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region Government 1-4 New organization structure is approved by Mayor,		<ol> <li>Plan for improvement of water bill collection is approved by EDWS.</li> <li>Plan for human resources development is approved by EDWS.</li> <li>Jarafts of regulations, standards and guidelines</li> </ol>	<ul> <li>(1-1 in version 2 is moved to 2. of Project Purpose Inn version 3.)</li> <li>1-1 Activity on improvement of water bill collection is added.</li> <li>1-2 The approval is required by EDWS.</li> <li>1-3 The approval is required by EDWS.</li> <li>1-4 The approval is required by Mayor. Currently, organization reform is under implementation in</li> </ul>	
utility is improved.	<ul> <li>for water supply services in Yangon is approved by Yangon Region Government</li> <li>1-4 New organization structure is approved by Mayor.</li> </ul>	for water supply services in Yangon is approved by EDWS. 1-4 New organization structure is approved by Mayor. 1-5 2 full time staff members in Planning Section	<ol> <li>The approval is required by Mayor. Currently, organization reform is under implementation in YCDC.</li> <li>Added for PDCA cycle management.</li> </ol>	
utility is improved. Capacity of YCDC on NRW management is improved.	<ul> <li>1-5 Date of regulations, sandards and guidelines for water supply services in Yangon is approved by Yangon Region Government</li> <li>1-4 New organization structure is approved by Mayor.</li> <li>2-1 Manuals and training materials are fully utilized by more than xx persons of YCDC staff</li> <li>2-2 Information of customers and pipes for the pilot areas is compiled and updated.</li> <li>2-3 xx% of YCDC staff participates training on NRW</li> <li>2-4 Plan for NRW reduction is approved by YCDC</li> </ul>	for water supply services in Yangon is approved by EDWS. 1-4 New organization structure is approved by Mayor. 1-5 2 full time staff members in Planning Section can give direction of PDCA cycle to EDWS staff. 2-1 Manuals and training materials are utilized by YCDC staff. 2-2 Information of customers and pipes for the pilot areas is compiled and updated. 2-3 The number of trainers for NRW management becomes 8. 2-4 EDWS staff participates in training based on training plan for NRW management.	<ol> <li>1-4 The approval is required by Mayor. Currently, organization reform is under implementation in YCDC.</li> <li>1-5 Added for PDCA cycle management.</li> <li>2-1 The number of persons should be specified in NRW training plan. This indicator is similar to 2-3 in version 2.</li> <li>2-2 No change.</li> <li>2-3 Added as the development of trainers is important to extent NRW management to the entire service area.</li> <li>4 The number of persons should be specified in NRW training plan.</li> <li>(2-4 in version 2 is moved to s moved to 5. of Profet Ruropes im version 3 in</li> </ol>	

Attachment 1: Main points discussed and decided

## 1. Mid-term Management Plan

The Mid-term Management Plan of EDWS for the period from FY2018/19 to 2020/21 was

explained according to the main points listed below and confirmed.

(1) Planning Cycle of Mid-term Management Plan

(3) Long-term Vision and Mission (2) Table of Contents

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(4) Mid-term Management Policy and Objectives

(5) Priority Area and Major Activity for Mid-term

(6) Performance Targets
 (7) Financial Projection and Key Pre-condition

# 2. Progress of the Project and Mid-term Evaluation

based on the Objectively Verifiable Indicators specified on PDM. In general, the progress of It was confirmed by all participants that implementation of previous recommendations and conclusions made in the past five JCC meetings are in progress. Regarding the overall progress of the Project and possibilities to achieve Project Purpose and Outputs were clarified the Project is almost on the track.

In terms of five evaluation criteria: Relevance, Effectiveness, Efficiency, Impact and Sustainability, the Project was evaluated as mid-term evaluation as table below.

Evaluation	Good, no significant change since project design.	Expected to he good. Most OVIs are expected to be achieved.	Mostly good. NRW related activities were delayed due to late delivery of equipment.	To increase Impact, it is necessary to implement Mid-term Management Plan firmly, which contributes in improving services.	To maximize Sustainability, PDCA cycle with utilization of Min-term Management Plan should be established and continued.
Aspect evaluated	Does Project meet actual needs and aligns with strategy?	To what extent Project purpose has been achieved?	How is cost performance?	What are positive/negative changes produced by Project?	Will benefits continue after the project completion by self-effort?
Criteria of evaluation	Relevance	Effectiveness	Efficiency	Impact	Sustainability

YCDC side suggested that outcomes of the Project should be measured from the wider points of view than the specified OVIs since fruits of the Project can be seen to emerge in various aspects.

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Attachment 2: Project Monitoring Sheet Version 5

THE REPUBLIC OF THE UNION OF MYANMAR YANGON CITY DEVELOPMENT COMMITTEE (YCDC) JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YCDC	MONITORING SHEET VERSION 5	OCTOBER 2018	YCDC COUNTERPARTS TEAM AND JICA TECHNICAL ASSISTANCE EXPERTS TEAM	A) &
CILIEF REPRESENTATIVE OF JICA MYANMAR OFFICE	PROJECT MONITORING SHEET	et Title : The Project for Improvement of Water Supply Management of YCDC m of the Sheet: Ver. 05 (Term: March - September, 2018) Name: Mr. Aung San Win Title: Project Director (Head of Department, Chief Engineer) Name: Mr. Hirotaka Sato Title: Chief Advisor Submission Date: 16 <sup>th</sup> October 2018				i.
TO		Projection Version				9

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The Project for Improvement of Water Supply Management of YCDC

Monitoring Sheet Ver. 5

L Summary

L	Prog	ress
	1-1	Progress of Inputs
	1-2	Progress of Activities
	1-3	Achievement of Output
	14	Achievement of the Project Purpose
	1-5	Changes of Risks and Actions for Mitigation
	1-6	Progress of Actions undertaken by JICA
	1-7	Progress of Actions undertaken by YCDC side
	1-8	Progress of Environmental and Social Considerations (if applicable)
	6-1	Progress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable
	1-10	Other remarkable /considerable issues related/ affect to the Project (such as other JIC
		projects, activities of counterparts, other donors, private sectors, NGOs. etc.)
~	Delay	/ of Work Schedule and / or Problems
	2-1	Detail
	2-2	Cause
	2-3	Action to be taken
	2-4	Roles of Responsible Persons / Organizations
3	Modi	ification of the Project Implementation Plan
	3-1	Project Design Matrix (PDM).
	3-2	Plan of Operation (PO).
4	Preps	aration by YCDC side toward after completion of the Project

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Project Monitoring Sheet
 Plan of Operation Version 6 (Modified Schedule)

Annex

1. Summary of Project Risk

Appendix

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I. Summary

1 Progress

1-1 Progress of Inputs

Item       1. Counterpart       personnel       2. Office space and       facilities       3. Necessary data/       information       information       of the activities	Con 1) Counterpart In Aug 2015, the counterparts (C/P) o Samitation (EDWS) were assigned. Afte Version 4	tents f Engineering Department of Water ar r then, several changes have been mad is as given in the Monitoring Sheet (Mi Sheet (Mi Sheet of Mater and the members we officially launched and the members we officially launched and the members we officially launched and the members we diations, sub working groups (WG) and the Svension 4. Under the S/C No.3, whit ulations, sub working groups (WG) and the sub working groups (WG) and the sub working groups (WG) and the sub working groups (WG) and the sub working aroups (WG) and the sub working groups (WG) and the sub working aroup (3-1 to study on Water dianagement, and WG3-5: 55 + Kaize organized in WG 3-1 to study on Water diag and Collection, respectively. ment this Project activity are provided b ing regulations, standards, guidelines ection data, specification and drawings mes, pipeline information, water quality met, pipeline information, water quality regulations at informed in the MS Version 3. -Completed
	No.3 Operation and maintenance costs of the provided PCs for monitoring Pls Updating costs by anti-virus for the above provided PCs	<ul> <li>-Procurement and installation is finished.</li> <li>-Training of PC utilization is being regularly implemented.</li> <li>-Update of anti-virus soft is necessary (every year)</li> <li>-O&amp;M costs of PCs (including printer ink) have been secured.</li> </ul>
	No.4 NRW pilot project cost	- The budget for this purpose in fiscal year 2019 has been acquired and ready to start other project.
	No.5 Nyaughnapin WTP improvement cost	-Anthracite has been procured by EDWS. Flow meters to measure backwash flow

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	modification of the pilot sedimentatio basin and filter was made by EDWS.
No.6 Tax, commission fee etc. of delivery and registration for the equipment procured and transmitted from the Japanese side.	- Tax and commission fee for the impor procedure of equipment was disburse by YCDC.
No.7 Electricity cost of project offices, equipment provided and construction of flow meter chambers	-Office utilities are paid by YCDC Electricity cost will be paid by YCDC after installation.

Item		Contents	
<ol> <li>Expert</li> <li>Consultant team</li> </ol>	Planned input and actual p (1) Term 1	erformance of consultant exp	cert is shown below;
	Site	Planned MM	Actual MM
	Myanmar	77.5	72.29
	Japan	3.00	3.15
	Total	80.50	75.44
			The remaining MM is transferred to Term 2.
	JICA long term expert		16.70
	(2) Term 2 (June 2017 to J	July 2020)	
	Site	Planned MM (Term2 all)	Actual MM as of end of September, 2018
	Myanmar	111.0	49.37
	Japan	8.1	2.6
	Total	1.911	51.97
	JICA long term expert	24	17
<ol> <li>Experts from waterworks in Japan (advisory committee)</li> </ol>	Advisory committee meeti The activities of advisory c FY2018.	ing was held in Japan in 26 <sup>m</sup> ; committee members in Myan	September. mar are not scheduled in
2. Equipment	<ul> <li>The equipment and materi The summary of status of f The readering for flo- contractors have been monitoring system wi equipment in local off (Completed)</li> <li>(2) Equipment in local off (Completed)</li> <li>(3) Equipment for water of proposed offices of Y(</li> <li>(4) Equipment for water (on by JICA Expert Team by JICA Expert Team</li> <li>(4) Equipment (one was delivered and har was delivered and har</li> </ul>	ials to be procured in Term 2 procurement is as follows: em ( <b>On-going in Term 2</b> ) w monitoring system was et selected. Flow meters were d ill be delivered by the end of' and trial operation of electric fices for collection of electric Myanmar was made. The eq CDC and now is used. and is used. NRW management (1) (Con apality management (1) (Con and is used. NRW management (Excavate excavator) was procured by ded over to YCDC, before y	2 are the following 4 items. arried out by JICA HQ and delivered in Yangon and the year 2018. After arriving of arried out by March 2019. a data and calculation of PIs (upment was distributed to upleted) be equipment was delivered a) (Completed) r IICA Myanmar Office. It which training was given to

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Item	Contents
	(5) Equipment and materials for NRW management ( <b>On-going in Term 2</b> ) Tendering was implemented by JICA HQ and the contractor has been
	selected. Ine equipment is under procurement by une contractor. Inte equipment is expected to arrive ar Yangon in February 2019. (6) Manuals and reference hooks (Commilered)
	Manuals and reference books including ones requested by C/P were identified and procurement was <b>completed</b> . A library has been prepared by YCDC for their memoraneous and utilizations.
	(7) Equipment for water quality management (2) (Flow meter, desiccator and driet) (Completed in Term 2)
	<ol> <li>The procurement was completed. It is delivered and is used by YCDC.</li> <li>Bouinment and materials for NRW training vard: Preparation and design were</li> </ol>
	completed and the draft of preparation documents for bidding was submitted to JICA HO. The tender will start in October 2018 and the equipment plans to
	deliver in May at the carliest. (Ou-going in Term 2) The status of procurement of equipment and materials is shown in the Note:
3. Overseas	<ul> <li>The third country training in Cambodia (PPWSA) of NRW management and</li> </ul>
Training Program	water quality management was implemented in Sep. to Oct. 2017 and Feb. 2018, respectively.
l raining in Japan and/or neighboring countries	<ul> <li>Training in Japan was implemented in Tokyo (Tokyo Metropolitan Government Office) in January 2018.</li> </ul>
4. Local cost	Establishment of Expert Team office with internet connection in YCDC building.

Water quality test Water quality equipment, equipment, equipment, adminiment, equipment, adminiment, equipment was done.	Equipment Contents Procur In charge of Quantity Progress	
Myse         Myse         Myse         Myse         Myse         SICA         Procurement was done.         CC           abgerreption         mark         Mysemase         1 set         Procurement was done.         Septi Septi           abgerreption         emineration         Japen         JICA HQ         1 set         The delroys is under annegament to the delroys is under annegament to the delroys is under to provide the comment to the annegament to the delroys is under annegament to the delroys is under annegament to the annegament to the annegament to the annegament to the annegament to the response delinitistration books         JICA HQ         1 set         The delroys is under annegament to the contractor.         1 (1           ference         Technical, fittings         Japan         JICA HQ         1 set         The delroys is under annegament to the contractor.         1 (1           ference         Technical, fittings         Japan         JICA HQ         1 set         The delroy is under annegament to the contractor.         (1           ference         administration books         USA         Japan         JICA Laper         1 set         The delroy is under annegament to the response delinities and doir         M           mater quality         How more <i>P</i> ends         Japan         JICA Laper         Leet         M         (1	ww         Without         Ultra-sonie flow meter, attinicing         Japan         JICA HQ         21 ests, 9 attinicing         Indentity we are been delivered. Mol polityery of that collection         D           upment for computers, printers, proper attinicing         KTU, communication         Japan         JICA HQ         21 ests, 9         Indentityery of that collection         by:           JPIS         computers, printers, proper atting         Myan         Expert         59 sets         Procurement was done.         Co.           JPIS         magement         tanione         Lapan         Expert         1 set         Procurement was done.         Co.           unspenent         ter quality, glassware         Myan         Myanmar         1 set         Procurement was done.         Co.           Unternal         polyners, plassware         Myan         Myanmar         1 set         Procurement was done.         Co.           Reservation         for improve wate         Japan         JICA HQ         1 set         Tradefing was implemented.         E           Ausilisation boils         Japan         JICA HQ         1 set         Tradefing was implemented.         E           Ausilisation colose         Japan         JICA HQ         1 set         Tradefing was implemented.         E	New
Recurstor         Myan         JICA         Isel         Procurement was done.         Complexity           NRW         Internal pipe survey         mar         Office         Procurement was done.         September           Internal pipe survey         Internal pipe survey         Internal pipe survey         Internal pipe survey         Evaluation         Complexity           and detection and detection         Japan         JICA HQ         1 set         Tendering was implemented.         Feb 30           Pipes, valves, fittings         Japan         JICA HQ         1 set         Tendering was implemented.         Feb 30           Pipes, valves, fittings         Japan         JICA HQ         1 set         Tendering was implemented.         Feb 30           Reference         Feb 30         Tendering was implemented.         Tendering was implemented.         Feb 30           Settermote         Japan         JICA HQ         1 set         Tendering was implemented.         Feb 30           Reference         Tendering was implemented.         Tendering was implemented.         Feb 30         Internation tendering was implemented.         Feb 30           Materia distribution books         Japan         JICA Japan         I set         Tendering was implemented.         Feb 30           Materia dint res	Flow montoring system         Ultra-sonic flow meter, equipment, equipment for computers, man protection         Japan Japan         JICA HQ         21 sets, stations         Tendering was done; matrixed and inserts system is under proparation.         Dec. 20           Equipment for debrifs         Computers, man protection         Myan         Japan         Japa	Comple March 2
NRW NRW         Excavator         Myam mar         JICA Myammar         1 set         Procument was done.         Complet September           NRW margement interal pipe and detection and detection set         Interal file         Myammar         1 set         Procument was done.         September           NRM margement and detection and detection and detection and accessories         Myammar         1 set         Tendering was implemented.         Eep 201           Pipes, values, fittings and accessories         Japan         JICA HQ         1 set         Tendering was implemented.         (tendative tendering was implemented.           Pipes, values, fittings and accessories         Japan         JICA HQ         1 set         Tendering was implemented.         (tendative tendering was implemented.	Flow monitoring provides         Luding and system         Luding provides         Luding provides         Desc. 20 by Marsi provides         Desc. 20 by Marsi provides	Complet March 2(
NRW         Myain maragement         JICA maragement maragement         Led by Symmar         Procurement was done.         Complet September           namagement         internal         pipe         aurvey         Office         Tendering was implemented.         September           and detection         camera.         detection         Japan         JICA HQ         1 set         Tendering was implemented.         Feb 201           and         DMA         Tend         1 set         1 set         anderection         (tentative)	Flow maintering system         Ludita-solie flow meter, maintering         Japan         JICA HQ         21 sets, 9 stations         Interactions before and system is under lave been different         Pixet and bisers targe          Pixet and bisers target         Pixet and bisers target         Pixet and bisers         Pixet and bisers<	Feb 201 (tentativ
Excavator Myan Mammar I sci Procurement was done September.	Flow monitoring system         Uttra-scole flow meter, equipment         Japan         JICA HQ         21 sets, 9 stations         Tendent Pow meters have been delivered.         And insult by Mat is by Mat is by Mat is poster         Deliver y of data collection by Mat is poster         Dec. 201           Equipment for equipment for and PIS         Computers, poster         Myan         JICA HQ         21 sets, 9         meters have been deliverion.         Dec. 201         Mod insult by Mat is transition.           Equipment for equipment, equipment for improve water         Myan         Expert         59 sets         Procurement was done.         Complet August 30.           Water quality equipment, equipment, equipment quality, gassware         Japan         Expert         1 set         Procurement was done.         December:           NRW         Excavator         Myannar         1 set         Procurement was done.         Complet Setterber.	Feb 201 (tentativ
	Flow monitoring system         Ultra-sonic flow meter, equipment         Japan         JICA HQ         21 sets, 9 stations         Tendering was done flow         Dec. 201           system         equipment         faith         JICA HQ         21 sets, 9         meters have been delivered.         Mad installs           system         equipment         faith         JICA HQ         21 sets, 9         meters have been delivered.         Mad installs           Equipment         for         paint         Expert         59 sets         Procurement was done.         Complete August 20           Water         quality, test         fapen         fapent         1 set         Procurement was done.         Complete August 20           Management         for improve water         Japan         tsoft         1 set         Procurement was done.         Complete Complete	Complete September 2
	Flow         Ultra-sonic flow meter, monitoring         Tendering was done. Flow         Dec. 201           monitoring         RTU, extramation         Japan         JICA HQ         21 sets.         9 meters the been delivered.         And installa Mar. 201           system         equipment         Japan         JICA HQ         21 sets.         9 meters the been delivered.         And installa Mar. 201           system         equipment         21 sets.         9 meters three been delivered.         Mar. 201	Complete August 20
Equipment for Computers, printers, Myan Expert 59 sets Procurement was done Complete and PIs		Dec. 2018 And installar by Mar. 20 (tentative

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1-2 Progress of Activities

The Term 2 started in June 2017 and 1 year and 4 months has been passed. The progress of activities is almost on the track except pilot project of NRW management in Yankin. The description of progress of activities on the Plan of Operation (PO) Version 5 is given in Annex-1.

1-3 Achievement of Output

The progress of achievement of Outputs is summarized as follows.

Output		Objectively Verifiable Indicator		Progress/Achievement
<ol> <li>Capacity of YCDC on institutional management of water</li> </ol>	Ξ	Plan for improvement of water bill collection is approved by EDWS.	17	Plan for improvement of water bill collection was explained in S/C.3. It needs final approval by CE.
supply utility is improved.	1-2	Plan for human resources development is approved by EDWS.	1-2	A plan for human resources development has been under preparation.
	1-3	Drafts of regulations, standards and guidelines for water supply services in Yangon is	<u>1</u>	The preparation of required regulations, standards and guidelines including water
	-	approved by FDWS		supply regulation has been started. Steering Committee (S/C) 3 has been established for this purpose. <u>The progress</u> should be facilitated according to the
	Ï,	New organization structure is approved by Mayor.	4	New organization structure was prepared and is under process of approval of the
				vator. New organization set-up with new sections was completed and the activities are implemented by the new organization although an approval is not obtained by Mayor. Moreover, entire YCDC
				organization is now under restructured. The proposed plan should accord with the YCDC organization restructured.
	1-5	2 Full time staff members in Planning Section	1-2	No full time C/P was assigned and one dadioated not time member 1of the
		can give direction of FULA cycle to FUWS staff.		ueucarea part-une memoer jeu ue planning team because she entered a graduated university in Japan. 2 full time members at least shuild he assigned
2. Capacity of YCDC on NRW management is	2-1	Manuals and training materials on NRW management are utilized by YCDC staff.	2-1	Preparation of manual and training materials has been started but final ones will be prepared after the pilot project
improved.	2-2	Information of customers and pipes for the pilot areas is compiled and updated.	2-2	implementation. Information of customers and pipes for the pilot areas was compiled. They will be updated after implementation of the pilot
	2-3	The number of trainers for NRW management becomes 8.	2.3	project. The related activities has been started along with several activities on NRW management. Finally, they will be trained
	2.4	EDWS staff participates in training based on	2-41	in pilot project and training yard. It has not yet started.
	2-5	training plan for NRW management. NRW ratio is decreased to 25% in the pilot	2-5	The pilot project has not yet started.

3-1 Part of the manuals and SOP have been prepared and utilized. More manuals and training materials will be prepared.	3-2 Monthly water quality monitoring reports have been prepared and submitted to CE.	3-3 Water quality monitoring and treatment seminars by experts are being implemented to develop mainers. Some of them have	given utaming to the west started.	3-5 The pilot project has been implemented and the result of treated turbidity is satisfactory.	3-6 Lagunbyn water treatment plant system is under construction and has not yet	operated. 3-7 The operation and maintenance system of chlorination facilities in Yegu pumping	station has been set up but other chlorination facilities is under construction and has not yet operated.
Manuals and training materials on water quality management are fully utilized by YCDC staff	2 Result of the water quality test by the central laboratory and on-site mini laboratory is recorded and monitored periodically.	The number of trainers for water quality management becomes 4.	H EDWS staff participates in training based on training plan for water quality management.	<ol> <li>The turbidity of treated water in pilot sand filter in Nyaunghnapin water treatment plant is controlled less than 1 NTU.</li> </ol>	i The operation and maintenance system of Lagunbyin water treatment plant is prepared	The operation and maintenance system of chlorination facilities is prepared.	
5 A.S	5	3-5	3.4	3-5	3-6	3-1	
<ol> <li>Capacity of YCD on water quality management</li> </ol>	improved.						

1-4 Achievement of the Project Purpose

Gradually, the project purposes have been achieved.

Capacity of YCDC on the management of water supply imp service is improved. 2. Mid by I 3. The man MK	ering Committees (S/C) are organized improvement actions are	A
2. Mid by f 3. The man	olemented	<ol> <li>S/C1, 2 and 3 were oncreatly organized. Improvement actions will have continued until the end of the project S/C should become a center and driving force of PCDC cycle.</li> </ol>
3. The man MK	3-term management plan is approved EDWS	<ol> <li>First Mid-term management plan will be approved in October, 2018.</li> </ol>
MK	e implementation of mid-term ugement plan is monitored based on	<ol> <li>The monitoring system has been prepared and operated. Monitoring will be</li> </ol>
	CPIS	continued until the end of the project. Water flow data of production and
		transmission has not been obtained yct. The data will be available when SCADA
4 Thu	MBW min is smaller in the second	system is introduced in March, 2019.
4. Lite Supp	NKW fatto is grasped in the water olv service area of YCDC and	4, initial INKW rate 18 to be estimated after introduction of flow meter and SCADA
uoui	uitored.	in March, 2019. Monitoring will be
	and the second se	continued.
5. Plan	for NRW reduction is approved by	5. The discussion for formulation of plan
EUV	¥5.	priority activities will be drafted in 2018.
6. Wate	er quality is grasped in the water	6. Achieved. Monthly water quality
ddns	ply service area of YCDC and	monitoring report has been submitted to
mon	utored	CE.
7.Plan	1 for improvement of water quality is	7. The activity has not yet started.

1-5 Changes of Risks and Actions for Mitigation

The summary of detail project risks which was prepared in the preparatory survey is shown in Appendix-1. Two risks or changes are now identified and may affect the Project. Delay of

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anonimant of animum handre vality. Anorefinally and of activities of Nan revenue water	1-10 Other remarkable considerable issues related affect to the Project Scieb as other IICA's
production of equipation occurs rearry. Accordingly, some of activities of routrevolue water	
(NKW) management and installation of now monitoring system will be delayed. The resonduting of related activities will be closely watched. This has been reported since Monitoring Sheet Version 3.	projects activities of counterparts, outst updates, private sectors, 1400s, etc.)
3	No remarkable and considerable issue has been identified. However, the following donor projects
1-6 Progress of Actions undertaken by JICA	should be closely monitored and coordinated with the Project.
	(1) NRW project by AFD (French Development Agency) has been started.
Following tender actions for the procurement of equipment and materials are under implementation	(2) The project for Reduction of NRW in Mayangone Township in Yangon City under Japan's Grant
by JICA Headquarters.	by Ministry of Foreign Affairs of Japan (Started in 2017 and under construction)
(1) Flow monitoring system (JICA Headquarters); Completed	(3) The project for development of water supply at Dala township under Japan's Grant by Ministry of
(2) Pilot project for NRW management (JICA Headquarters); Completed	Foreign Affairs of Japan (under preparation)
(3) NRW Training Yard (JICA Headquarters); under tender preparation	(4) Constructing of water treatment plan at Hlawga by AfD (under negotiation)
	(5) Greater Yangon Water Supply Improvement Project Phase I (Yen loan) (Under implementation:
1-7 Progress of Actions undertaken by YCDC side	Constructions stage)
	(6) Greater Yangon Water Supply Improvement Project Phase II (Yen Loan) (Under implementation:
Following actions was implemented by YCDC side.	Detailed Design Stage)
(1) Construction of chambers and kiosks for flow monitoring system was completed. Flow	(7) Installation of raw water conduit from Ngamoeik Reservoir to Nyaunghnapin water treatment
monitoring equipment is awaited for installation by YCDC anytime.	plant by ADB (Pre-feasibility study)
(2) The budget for the pilot project in fiscal year 2018/2019 has been acquired and YCDC is ready to	(8) Replacement of concrete pipe from Hlawga to Yegu with ductile iron pipe by YCDC own budget
start pilot project. YCDC side is waiting for delivery of equipment from Japan.	(Preparation stage)
(3) A building of NRW training yard will start constructing by YCDC in late 2018 and complete in	(9) Phase 3 of Nyaunghnapin water treatment plant by YCDC own budget is under preparation
early 2019.	
	2 Delay of Work Schedule and / or Problems
1-8 Progress of Environmental and Social Considerations (if applicable)	
Not applicable.	2-1 Detail
1-9 Proeress of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)	The following activities are delayed.
The Project contributes to Gender/Peace Building/Poverty Reduction with following measures:	(1) The activities related to preparation of pilot project for NRW management
• Clean and safe water supply which will be promoted through the Project will contribute to	2-3-7 Prepare action plan and procurement of equipment (leakage survey and repair) for
reduced health risk and stable livelihood, resulting in poverty reduction. This is related to the	the countermeasure to be taken for physical loss in the pilot area
Project overall goal.	
• In the activities of public awareness of the Project, women and children will be targeted and	The procurement of equipment for the countermeasure to reduce NRW in the pilot area is delayed and
focused as they are prime beneficiaries of the Project. School awareness program was	start and/or completion of the successive following activities related to NRW management will be
implemented in November 2017 and January 2018. It will be continued for the next fiscal year	delayed.
2018/19.	<ul> <li>2-3-3 Prepare training plan and training materials by the trainers (physical loss)</li> </ul>
• The Chairperson and Secretary of JCC are both women and many woman counterparts have	<ul> <li>2-3-4 Formulate manuals on physical loss</li> </ul>
participated in the Project so that the gender balance is kept in the Project.	<ul> <li>2-3-8 Set up DMAs at the pilot area (Including procure materials and construct DMA)</li> </ul>
	<ul> <li>2-3-9 Conduct the countermeasures against physical loss in the pilot area</li> </ul>
	<ul> <li>2-3-10 Evaluate cost-benefit of countermeasures against physical loss of the pilot area and</li> </ul>
	formulate the optimal model of activities
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Prepare training plan and training materials by the trainers (commercial loss) 2-4-3 .

- Formulate manuals on commercial loss 2-4-4 .
- Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the selected pilot area 2-4-6
- Conduct the countermeasures against commercial loss in the pilot area 2-4-7 .
- Evaluate cost-benefit of countermeasures against physical loss in the pilot area and formulate the optimal model of activities 2-4-8 •

Cause 2-2

The cause of delay of procurement of equipment is that tendering process in JICA Headquarters requires more time than planned.

Action to be taken 2-3

The tendering of procurement of materials and equipment was completed by JICA Headquarters and delivery of the equipment to the site. Accordingly, schedule of related activities is changed as shown in the supplier was identified. JICA has requested to the supplier to facilitate the procurement and (1) The activities related to preparation of pilot project for NRW management the modified Plan of Operation Version 6 in Annex-2.

Roles of Responsible Persons / Organizations 2-4

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The responsible persons and organization are as follows.

- (1) The activities related to preparation of pilot project for NRW management
  - 1) Overall responsibility. Chief Advisor, and DYCE2 of EDWS
- 2) Output team: JICA NRW experts and NRW Management Section

The roles of each team are as follows.

- 1) Chief Advisor will coordinate with JICA Headquarter to expedite tendering and procurement.
- 2) Chief Engineer is a consignee of procured equipment and is responsible for custom clearance and duty exemption procedures.
- 3) JICA NRW Experts and DYCE2 will follow up the mitigation measures stated above in time so as not to affect the Project outputs and purposes

# 3 Modification of the Project Implementation Plan

3-1 Project Design Matrix (PDM)

Restructuring of the Objectively Verifiable Indicators (OVIs) in the PDM have discussed in the 5<sup>th</sup>

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to modify the proposed OVIs structure with setting their values. After further discussion on the detail modifications, the PDM was finally revised by the third amendment of the signed R/D signed on 19th Joint Coordination Committee (JCC) Meeting on 26th February 2018 and both sides in principle agreed September 2018 between YCDC and JICA. The amendment of OVIs is shown as follows. Objectively Verifiable Indicator (hereinafter referred to as "OVI") and Means of Verification for Overall Goal of PDM version 2.

<ol> <li>The performance indicators (PIs) are improved 0.0% to CO% in the endocators commensement.</li> <li>The ratio of the data at the Project commensement.</li> <li>NRW is decreased from xx% to xx% in the water supply area of YCDC.</li> <li>The ratio of water quality test results which satisfy water quality standards is increased from Xx% to xx%.</li> </ol>	Before (as version 2)	Amended Version (as version 3)
<ol> <li>Commencement.</li> <li>NRW is decreased from xx% to xx% in the Project commencement.</li> <li>NRW is decreased from 00% to 00% in the water supply area of YCDC.</li> <li>The ratio of water quality test results which satisfy water quality standards is increased from 00%. The compliance ratio is increased from 00% to 00% in terms of the mater of increased from 00% to 00% in terms of the restinal chlorine (&gt;0.0 2 mg/l).</li> </ol>	<ol> <li>The performance indicators (Pls) are improved compared to the data at the Project</li> </ol>	1. The management key performance indicators (MKPIs) are improved compared to the data at
water supply area of YCDC. 3. The ratio of water quality test results which satisfy water quality standards is increased from $xx\%$ to $xx\%$ . Increased from 00% to 00% in terms of increased from 00% to 00% in terms of from $xx\%$ to $xx\%$ .	commencement. 2. NRW is decreased from xx% to xx% in the	the Project commencement. 2 NRW is decreased from 00% to 00% in the
satisfy water quality standards is increased meet the water quality standard is increased from $Xx\%$ to $Xx\%$ . from $Xx\%$ to $Xx\%$ . from $Xx\%$ to $Xx\%$ to $Xx\%$ .	water supply area of YCDC 3. The ratio of water quality test results which	water supply area of YCDC. 3. The compliance ratio in terms of turbidity to
increased from 00% to 00% in terms of residual chlorine (>0.2 mg/l).	satisfy water quality standards is increased from $xx^{96}$ to $xx^{96}$ .	meet the water quality standard is increased from 00% to 00%. The compliance ratio is
		increased from 00% to 00% in terms of residual chlorine (>0.2 mg/l).
	These official PIs of EDWS are to be adopted as I	Is for monitoring.

Key water quality parameter for monitoring is specified. Turbidity and residual chlorine wate chosen as these parameters are the main target parameters to be improved in the Project. 2.No change

(2) Means of Verification

TOTIONING OF A CUTICATION	
Before (as version 2)	Amended Version (as version 3)
Reports prepared by YCDC	1. S/C2 activity record, MKPIs monitoring sheets.
	<ol><li>S/C1 activity record, MKPIs monitoring sheets.</li></ol>
	3. Water quality monitoring report, MKPIs
	monitoring sheets.
Reason:	
Means of Verification is clarified accordin	z to OVI.

2. OVI, Means of Verification and Important Assumption for Project Purpose of PMD version 2

(I) OVI	
Before (as version 2)	Amended Version (as version 3)
1. Evaluation of PIs is conducted periodically 2. NRW is decreased from xx% to xx% in the	1. Steering Committees (S/C) are organized and improvement actions are implemented.
pilot area	2. Mid-term management plan is approved by
3. The ratio of water quality test results which	EDWS.
satisfy water quality standard is increased from	3. The implementation of mid-term management
xx% to xx%, in the pilot treatment plants.	plan is monitored based on MKPIs.
	4. The NRW ratio is grasped in the water supply
	service area of YCDC and monitored.
	5. Plan for NRW reduction is approved by EDWS.
	6. Water quality is grasped in the water supply
	service area of YCDC and monitored.
	7. Plan for improvement of water quality is

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construction and rehabilitation of facilities such construction and rehabilitation of water treatment	Before (as version 2)         Amended Version (as version 3)         2-1 Manuals and training materials are fully         2-1 Manuals and training materials on NRW           Fund for YCDC to enable it to execute YCDC will obtain budget or funds         or funds         for active than xx persons of YCDC         2-1 Manuals and training materials on NRW	Before (as version 2)         Amended Version (as version 3)         2-1 Manuals and training materials are fully         2-1 Manuals and training materials on NRW           nullized by more than we mercine of VCDC         and training materials are nullized by VCDC of the mercine of the more than we mercine of VCDC         and training materials are nullized by VCDC of the mercine of the	(1) OVI Before (as version 2) Amended Version (as version 3)	(2) Means of Verification (2) Means of Verification (2) Means of Verification (3) Anorded Version (as version 3) (4) Means of Verification (5) Means	DWS. Before (as version 2) Amended Version (as version 3)	1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by EDWS.         1-4 New organization structure is approved b Mayor.         1-5 2 full time staff members in Planning Se can give direction of PDCA cycle to E staff.         see in version 3.         action is added.         Amended Version (as version 3)         1-1 Approval in S/C3. or approval letter of C 1-3 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-4 Approval in S/C3. or approval letter of C 1-5 Evaluation by JICA Experts based on c 0 Management Planning Unit in Plat Reorganization.         OMI       In Report on in Institut	<ul> <li>1-2 Plan for human resources development is approved by Yangon Region Government.</li> <li>1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region Government</li> <li>1-4 New organization structure is approved by Mayor.</li> <li>1-4 New organization structure is approved by Mayor.</li> <li>1-3 The approval is required by EDWS.</li> <li>1-3 The approval is required by EDWS.</li> <li>1-4 No change.</li> <li>1-5 Added for PDCA cycle management.</li> <li>(2) Means of Verification</li> <li>Reason:</li> <li>Reason:</li> <li>Reports prepared by YCDC</li> <li>Reason:</li> <li>Reason:</li> </ul>	ndicators. naidering the pilot project on going. modified. The approval is required by EDWS. magement tred by EDWS. It y management. The by EDWS. Appointment letter for S/C members. S/C1, 2. Appointment letter of the Head of Department (CE). MKPIs monitoring sheets. NRW management report. Approval of Plan for NRW reduction in S/C1. Approval of Plan for The tor CE.	construction. Reason : Version 2 1. Moved to Output 2-5 in version 3 for more specific 2. Moved to Output 2-5 in version 3. Moved to Output 2-5 in version 3 and modified c 2. Moved to Output 3-5 in version 3 and modified c Version 3 1. Added to continue improvement action. 3. Added to continue improvement action. 4. Added to continue improvement action. 4. Added to continue improvement action. 4. Added to continue improvement action. 7. 3.4 in version 2 is moved here. The approval is requ 7. 3.4 in version 2 is moved here. The approval is requ (2) Means of Verification Before (as version 2) 2. 4. 4. Added to action and the action on water quarts action and the approval is required by YCDC 2. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5.
construction and rehabilitation of facilities such construction and rehabilitation of water treatment as water treatment plants, disinfection equipment plant, disinfection facility and distribution pipes.	Before (as version 2)         Amended Version (as version 3)         2-1 Manuals and training materials are fully         2-1 Manuals and training materials are fully         2-1 Manuals and training materials on NRM           Fund for YCDC to enable it to execute         YCDC will obtain budget or funds for ortentation of facilities only construction and reliabilitation of facilities only construction and reliabilities only construction and reliabilitation of facilities only constructin and reliabilitation of facilities only construction and	Before (as version 2)         Amended Version (as version 3)         2-1 Manuals and training materials are fully         2-1 Manuals and training materials on NRM           number of the second of VCDC	(3) Important Assumption (3) Important Assumption	Reports prepared by YCDC     1. Appointment letter for S/C members. S/C1, 2.       3 attivity record.       3 attivity record.       2 Approval letter of the Head of Department (CE).       2. Approval letter of the Head of Department (CE).       3. MKPIs monitoring sheets.       4. Approval letter of the Head of Department (CE).       5. Approval letter of the Head of Department (CE).       3. MKPIs monitoring sheets.       4. Approval of Planet report.       5. Approval of Planet report.       5. Approval letter of CE.       6. Monthly water quality monitoring report.       1. Approval letter of CE.       6. Monthly water quality in S/C2. or approval letter of CE.       6. Monthly water quality in S/C2. or approval letter of CE.       7. Approval letter of CE.       6. Monthly water quality in S/C2. or approval letter of CE.       9. Optimize the defermine of Planet to CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Approval letter of CE.       1. Appr	1. Plan for instructuous in magement is approved [1, Plan for human resources development is approved by Yangun Region Covertment.     1. Plan for human resources development is approved by Yangun Region Covertment.       1. Plan for human resources development is approved by Yangun Region Covertment.     1. Darfis of regulations, standards and guidalines for wate carefyly envises in Yangun Region Covertment.     1. Darfis of regulations, standards and guidalines for wate carefyly envises in Yangun Region Covertment.       1. Optim of regulations, standards and guidalines for wate carefyly envises in Yangun Region.     1. Arrest of the Hand Soc.     1. Arrest of the Hand Soc.       1. Market in management for Site approved by EDWS.     1. Arrest of the Hand Soc.     1. Arrest of the Hand Soc.     1. Arrest of the Hand Soc.       1. Market in management for Site and Soc.     1. Arrest of the Hand Soc.     1. Arrest of the PDCA cycle to the Hand Soc.     1. Arrest of the Hand Soc.       1. Market in management for Site approval is required by PDWS.     1. Arrest of the Hand Soc.     1. Arrest of the PDCA cycle to the magement for the Hand Soc.       1. Market in management for the Hand Soc.     1. Arrest of the PDCA cycle to the Market have and the Arrest in the Arrest of the Hand Soc.     1. Arrest of the Hand Soc.       1. Market in management for the Hand Soc.     1. Arrest of the PDCA cycle to the state of the Arrest of the Arrest of the Hand Soc.     1. Arrest of the Hand Soc.       1. Market in management for the Hand Soc.     1. Arrest of the Hand Soc.     1. Arrest of the Hand Soc.       1. Market in management for the Hand So	2 of PDM version 2	<ol> <li>OVI and Means of Verification for Output 2 of 1</li> <li>OVI</li> </ol>		Reason: Means of Verification is clarified according to OVI.
(3) Important Assumption       (3) Important Assumption         Before (as version 2)       Amended Version (as version 3)         Before (as version 2)       Amended Version (as version 3)         2-1 Manuals and training materials are fully       2-1 Manuals and training materials on NRV         Fund for YCDC to enable it to execute       YCDC will obtain budget or funds for	(1) OV1 (3) Important Assumption (3) Important Assumption	(1) OVI Before (as version 2) Amended Version (as version 3)		Reports prepared by YCDC     1. Appointment letter for S/C members. S/C1. 2.       3 activity record.     3 activity record.       3 activity record.     2. Approval of Mid-term management plan in S/C2 or approval letter of C1       2. Approval of Mid-term management plan in S/C2 or approval letter of the Head of Department (CE).     1.2 Approval in S/C2 or approval letter of C1       3. MKPls monitoring sheets.     1.3 Approval of Plan for the Head of S/D     1.4 Approval in S/C2 or approval proval letter of C1       3. MKPls monitoring sheets.     3. MKPls monitoring sheets.     1.4 Approval in S/C2 or approval proval of Plan for NRW reduction in S/C1.       3. MKPls monitoring sheets.     3. MKPls monitoring sheets.       4. NRW management report.     1.5 Approval of Plan for improvement of water quality montoring sheets.       5. Approval of Plan for NRW reduction in S/C1.     5. Approval of Plan for improvement of water quality in S/C2.       6. Membly water quality montoring report.     1.4 Approval of Plan for improvement of water quality in S/C2.	1.1 Plan for institutional management is approved by Yangun Region Government.     1.2 Plan for human resources development is approved by EDWS.       9. Yungun Region Government.     1.3 Drafts of regulations, standards and supproved by Vangon Region Government.       1.3 Drafts of regulations, standards and supproved by Vangon Region Government.     1.3 Drafts of regulations, standards and supproved by EDWS.       1.4 New organization structure is approved by Vangon Region Government.     1.4 New organization structure is approved by Mayor.       provoal is required by EDWS.     1.4 New organization structure is approved by Mayor.       not access and the end of the Antivity on intervence of the EDCA cycle to EL statistic structure is approved by Mayor.     1.4 New organization structure is approved by Mayor.       teach     1.1 New organization structure is approved by Mayor.     1.3 Drafts of regulations for varies approved by Mayor.       teach     1.1 New organization structure is approved by Mayor.     1.3 New organization structure is approved by Mayor.       teach     1.1 New organization structure is approved by Mayor.     1.3 New organization structure is approved by Mayor.       teach     1.1 New organization structure is approved by Mayor.     1.3 New organization structure is approved by Mayor.       teach     1.1 New organization structure is approved by Mayor.     1.4 New organization structure is approved by Mayor.       teach     1.1 New organization structure is approved by Mayor.     1.4 New organization structure is approved by Mayor.       teach				
Reason:       4. OVI and Means of Verification for Output 2 of PDM version 2         Means of Verification is clarified according to OVI.       10 OVI         (1) OVI       (1) OVI         (2) Important Assumption       Amended Version (as version 3)         Before (as version 2)       2.1 Manuals and training materials are fully         Fund for VCDC to enable it to execute <u>VCDC will obtain budget or funds for</u> utilized by more than xx persons of YCDC	Reason:       4. OVI and Means of Verification for Output 2 of PDM version 2         Means of Verification is clarified according to OVI.       (1) OVI         (3) Important Assumption       (3) Important Assumption	Reason:       4. OVI and Means of Verification for Output 2 of PDM version 2         Means of Verification is clarified according to OVI.       (1) OVI         (1) OVI       Bcfore (as version 2)         (3) Important Assumption       Amended Version (as version 3)	Reason: 4. OVI and Means of Verification for Output 2 of PDM version 2 Means of Verification is clarified according to OVI.	Reports prepared by YCDC     1. Appointment letter for S/C members. S/C1. 2.       3 activity record.     3 activity record.       2. Approval of Mid-term management plan in S/C2, or approval letter of C       2. Approval of Mid-term management plan in S/C2, or approval letter of C       3. MKPIs monitoring sheets.       3. MKPIs monitoring sheets.       3. MKPus monitoring sheets.       4. Approval of Plan for NRW reduction in S/C1.       5. Approval of Plan for NRW reduction in S/C1.       6. Management Planning Unit in Plan.       5. Approval of Plan for NRW reduction in S/C1.       6. Menthy ware resort.	1-1 Plan for instructional management is approved by Yangou Government.     1-1 Plan for human resources development is approved by Yangou Government.       1-2 Plan for human resources development is approved by Yangou Kegion Government.     1-3 Drafts of regulations, standards and sproved by Yangou is approved by Yangou is approved by Yangou is approved by Yangou kegion Government.       1-2 Plan for human resources development is approved by Yangou kegion Government.     1-3 Drafts of regulations, standards and wrate carpy by argou kegion optimation structure is approved by Jangou is approved by Yangou is approved by Yangou is approved by Yangou is approved by Jangou kegion (Sovernment).       I on project on going.     1-3 Drafts of regulations, standards and Wayou.       I on project on going.     1-3 Drafts of regulations, standards and Wayou.       I on project on going.     1-3 Drafts of regulations, standards and Wayou.       I on project on going.     1-3 Drafts of regulations, standards and Wayou.       I on project on going.     1-3 Drafts of PDVS.       I on project on going.     1-4 No forther and the more state bit of PDCA cycle namescinent.       I on defense SCLI. 2.     1-3 Drafts of PDVS.       I atter of the Head of Matern management.     1-4 No forther.       I atter of the Head of Matern management.     1-4 Approval in SICO.       I atter of the Head of Matern management.     1-4 Approval in SICO.       I atter of the Head of Matern management.     1-4 Approval in SICO.       I atter of the Head of Matern management.     1-4 Approval in S	OVI.	Reason: Means of Verification is clarified according to OVI.	Approval of Plan for improvement of water quality in S/C2, or approval letter of CE.	
6. Monthly water quality monitoring report.         7. Approval of Plan for improvement of water quality in S/C2. or approval letter of CE.         Reason:         8. Means of Verification is clarified according to OVI.         Reason:         0.1         0.2         0.1         0.2         10         10         11         12         12         13         14         15         16         17 <td>6. Monthly water quality monitoring report.         7. Approval of Plan for improvement of water quality in S/C2. or approval letter of CE.         Reason:         4. OVI and Means of Verification is clarified according to OVI.         Means of Verification is clarified according to OVI.         (1) OVI         (3) Important Asaumption</td> <td>6. Monthly water quality monitoring report.         7. Approval of Plan for improvement of water guality in S/C2, or approval letter of CE.         Reason:         Reason:         Reason:         Addition is clarified according to OVI.         Means of Verification is clarified according to OVI.         (1) OVI         (2) Important Asamption</td> <td>6. Monthly water quality monitoring report august water quality in S/C2, or approval letter of CE.       Reason:         7. Approval of Plan for improvement of water quality in S/C2, or approval letter of CE.       Means of Verification is clarified according to OVI.         Reason:       4. OVI and Means of Verification for Output 2 of PDM version 2</td> <td>DULUE (as VERICIA 5) Amended Vision (as VERICIA 3)</td> <td>1-1 Plan for institutional management is approved by EDWS.         by Yaugun Region Government.         by Yaugun Region Government.         1-2 Plan for human resources development is approved by EDWS.         1-2 Plan for human resources development is approved by Yangon Region Government.         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region         1-4 New organization structure is approved by EDWS.         proval is required by EDWS.         more and the immediate of water bill collection of PDCA cycle to E proved is required by EDWS.         more and the immediate of water bill collection is added.            more and the immediate of water bill collection is added.  </td> <td>Amended Version (as version 3)           L1 Approval in S/C2, or approval letter of C           1-2 Approval in S/C2, or approval letter of C           1-3 Approval in S/C3, or approval letter of C           1-4 Approval in S/C3, or approval letter of C           1-5 Evaluation by the Experts.           1-5 Evaluation by the Experts.           1-5 Evaluation by the Panning Unit in Pla           of Management Planning Unit in Pla           Section in Report on Institu           Recorganization.</td> <td>Before (as version 2) Reports prepared by YCDC</td> <td>Appointment letter for S/C members. S/C1, 2. 3 activity resord. Approval of Mid-term management plan in S/C2, or approval letter of the Head of Department (CE). MKPIs monitoring sheets. Approval of Plan for NRW reduction in S/C1, or approval letter of CE.</td> <td>Reports prepared by YCDC 12.</td>	6. Monthly water quality monitoring report.         7. Approval of Plan for improvement of water quality in S/C2. or approval letter of CE.         Reason:         4. OVI and Means of Verification is clarified according to OVI.         Means of Verification is clarified according to OVI.         (1) OVI         (3) Important Asaumption	6. Monthly water quality monitoring report.         7. Approval of Plan for improvement of water guality in S/C2, or approval letter of CE.         Reason:         Reason:         Reason:         Addition is clarified according to OVI.         Means of Verification is clarified according to OVI.         (1) OVI         (2) Important Asamption	6. 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OVI and Means of Verification for Output 2 of PDM version 2	DULUE (as VERICIA 5) Amended Vision (as VERICIA 3)	1-1 Plan for institutional management is approved by EDWS.         by Yaugun Region Government.         by Yaugun Region Government.         1-2 Plan for human resources development is approved by EDWS.         1-2 Plan for human resources development is approved by Yangon Region Government.         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region         1-4 New organization structure is approved by EDWS.         proval is required by EDWS.         more and the immediate of water bill collection of PDCA cycle to E proved is required by EDWS.         more and the immediate of water bill collection is added.            more and the immediate of water bill collection is added.	Amended Version (as version 3)           L1 Approval in S/C2, or approval letter of C           1-2 Approval in S/C2, or approval letter of C           1-3 Approval in S/C3, or approval letter of C           1-4 Approval in S/C3, or approval letter of C           1-5 Evaluation by the Experts.           1-5 Evaluation by the Experts.           1-5 Evaluation by the Panning Unit in Pla           of Management Planning Unit in Pla           Section in Report on Institu           Recorganization.	Before (as version 2) Reports prepared by YCDC	Appointment letter for S/C members. S/C1, 2. 3 activity resord. Approval of Mid-term management plan in S/C2, or approval letter of the Head of Department (CE). MKPIs monitoring sheets. Approval of Plan for NRW reduction in S/C1, or approval letter of CE.	Reports prepared by YCDC 12.
(2) Means of Verification       (2) Means of Verification         (2) Means of Verification       (2) Means of Verification         Before (as version 2)       1. Approval in SC2, or approval in SC3, or approval in SC3, or approval in SC3, or approval in SC2, or approval in SC2, or approval in SC3, or approval in SC4, or approval in S	(2) Means of Verification       (2) Means of Verification         Before (as version 2)       Amended Version (as version 3)         Before (as version 2)       Amended Version (as version 3)         Reports prepared by VCDC       1 Approval In SCG, or approval letter of C         Reports prepared by VCDC       1.4 Approval In SCG, or approval letter of C         2. Approval letter of C       1.2 Approval In SCG, or approval letter of the Head of Dopartment CEI.         3. MKPIs monitoring sheets       1.4 Approval In SCG, or approval letter of the Head of Dopartment CEI.         3. MKPIs monitoring sheets       1.4 Approval In SCG, or approval letter of C         4. Approval letter of C       1.4 Approval In SCG, or approval letter of C         5. MKPIs monitoring sheets       1.5 Controval letter of C         4. Approval letter of CE       1.4 Approval letter of CE         5. MKPIs monitoring sheets       1.5 Controval letter of CE         6. Monthy water quality monitoring sheets       1.5 Controval letter of CE         6. Menthy water quality monitoring sheets       1.5 Evaluation by TICA Experts         6. Menthy water quality monitoring sheets       1.5 Evaluation by TICA Experts         6. Menthy water quality monitoring sheet       1.5 Evaluation by TICA Experts         6. Menthy water of CE       Means of Verification is clarified according to OVI.         1. Approval letter of CE	(2) Means of Verification       (2) Means of Verification         Before (as version 2)       Amended Version (as version 3)         Before (as version 2)       1. Appointment letter for S/C members. S/C1. 2.         Before (as version 2)       1. Appointment letter for S/C members. S/C1. 2.         Before (as version 2)       2. Approval of Mid-term management plan in S/C3, or approval letter of C         S/C2. or approval letter of C       1.1 Approval of Mid-term management plan in S/C3, or approval letter of C         S/C3. or approval letter of the Head of Department (CE).       3. MKPis monitoring sheets.         3. MKPis monitoring sheets.       1.3 Approval in S/C3, or approval letter of C         3. MKPis monitoring sheets.       1.4 Approval in S/C3, or approval letter of C         4. Approval of Plan for immorphy water quality monitoring sheets.       1.5 Evaluation by Mic Z, section in Plan         5. Approval letter of CE.       Means of Verification is clarified according to OV.         1. Approval letter of CE.       Means of Verification is clarified according to OV.         1. Approval letter of CE.       Means of Verification is clarified according to OV.         1. Approval letter of CE.       Means of Verification is clarified according to OV.         1. Approval letter of CE.       Means of Verification is clarified according to OV.         1. Approval letter of CE.       Means of Verification is clarified according to OV. <td>(2) Means of Verification       (2) Means of Verification         Before (as version 2)       Amended Version (as version 3)         Before (as version 2)       1. Appointment letter for SIC members. SICI. 2.         Reports prepared by VCDC       1. Approval in SIC2, or approval letter of C.         3 attivity record.       2. Approval of Mid-term management plan in SIC2, or approval letter of C.         2. Approval of Mid-term management plan in SIC1.       2. Approval of Mid-term management plan in SIC2, or approval letter of C.         3 attivity record.       2. Approval of Mid-term management plan in SIC1.         3 mKPls monitoring sheets.       1.4 Approval in SIC3, or approval letter of C.         1.4 Approval of Plan for improvement export.       1.4 Approval in SIC3, or approval letter of C.         2. Approval of Plan for improvement export.       1.4 Approval in SIC3, or approval in tere.         3. MKPls monitoring sheets.       1.4 Approval in SIC3, or approval in tere.         4. Approval of Plan for improvement export.       1.5 Evaluation by JIC4. Experts hasked on of Management.         5. Approval letter of CE.       1.4 Approval inter of CE.         6. Monthly water quality monitoring report.       1.5 Evaluation by JIC4. Experts hasked on of Management.         7. Approval letter of CE.       2. Approval inter of CE.         7. Approval letter of CE.       2. Approval of Plan for improvement of Weats of Verification is clarified accord</td> <td></td> <td>1-1 Plan for instructional management is approved by Yangon Region Government.         1-2 Plan for human resources development is approved by EDWS.         1-2 Plan for human resources development is approved by EDWS.         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon is approved by Yangon is approved by EDWS.         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon is approved by Yangon is approved by EDWS.         1-4 New organization structure is approved by Yangon is approved by EDWS.         1-4 New organization structure is approved by EDMS.         1-4 New organization structure is approved by EDMS.         1-4 New organization structure is approved by EDCA cycle to E staff.</td> <td>sse in version 3. ction is added.</td> <td>Reason: 1-1 in version 2 is moved to 2. of Project Purpose in 1-1 Activity on improvement of water bill collection 1-2 The approval is required by EDWS. 1-3 The approval is required by EDWS. 1-4 No change. 1-5 Added for PDCA cycle management.</td> <td>modified. The approval is required by EDWS. nagement ired by EDWS. lity management. ired by EDWS.</td> <td><ol> <li>1.1 in version 2 is moved here and name of plan is</li> <li>3. Added to continue improvement action.</li> <li>4. Added to continue improvement action on NkW mc</li> <li>5. 2-4 in version 2 is moved here. The approval is requ</li> <li>6. Added to continue improvement action on water qu</li> <li>7. 3-4 in version 2 is moved here. The approval is requ</li> </ol></td>	(2) Means of Verification       (2) Means of Verification         Before (as version 2)       Amended Version (as version 3)         Before (as version 2)       1. Appointment letter for SIC members. SICI. 2.         Reports prepared by VCDC       1. Approval in SIC2, or approval letter of C.         3 attivity record.       2. Approval of Mid-term management plan in SIC2, or approval letter of C.         2. Approval of Mid-term management plan in SIC1.       2. Approval of Mid-term management plan in SIC2, or approval letter of C.         3 attivity record.       2. Approval of Mid-term management plan in SIC1.         3 mKPls monitoring sheets.       1.4 Approval in SIC3, or approval letter of C.         1.4 Approval of Plan for improvement export.       1.4 Approval in SIC3, or approval letter of C.         2. Approval of Plan for improvement export.       1.4 Approval in SIC3, or approval in tere.         3. MKPls monitoring sheets.       1.4 Approval in SIC3, or approval in tere.         4. Approval of Plan for improvement export.       1.5 Evaluation by JIC4. Experts hasked on of Management.         5. Approval letter of CE.       1.4 Approval inter of CE.         6. Monthly water quality monitoring report.       1.5 Evaluation by JIC4. Experts hasked on of Management.         7. Approval letter of CE.       2. Approval inter of CE.         7. Approval letter of CE.       2. Approval of Plan for improvement of Weats of Verification is clarified accord		1-1 Plan for instructional management is approved by Yangon Region Government.         1-2 Plan for human resources development is approved by EDWS.         1-2 Plan for human resources development is approved by EDWS.         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon is approved by Yangon is approved by EDWS.         1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon is approved by Yangon is approved by EDWS.         1-4 New organization structure is approved by Yangon is approved by EDWS.         1-4 New organization structure is approved by EDMS.         1-4 New organization structure is approved by EDMS.         1-4 New organization structure is approved by EDCA cycle to E staff.	sse in version 3. ction is added.	Reason: 1-1 in version 2 is moved to 2. of Project Purpose in 1-1 Activity on improvement of water bill collection 1-2 The approval is required by EDWS. 1-3 The approval is required by EDWS. 1-4 No change. 1-5 Added for PDCA cycle management.	modified. The approval is required by EDWS. nagement ired by EDWS. lity management. ired by EDWS.	<ol> <li>1.1 in version 2 is moved here and name of plan is</li> <li>3. Added to continue improvement action.</li> <li>4. Added to continue improvement action on NkW mc</li> <li>5. 2-4 in version 2 is moved here. The approval is requ</li> <li>6. Added to continue improvement action on water qu</li> <li>7. 3-4 in version 2 is moved here. The approval is requ</li> </ol>
<ul> <li>1. Ander o commune improvement action.</li> <li>3. Added to common present action.</li> <li>3. Added to common present action.</li> <li>3. Added to common present action.</li> <li>3. Added to common provement of water action and action.</li> <li>3. Added to common present action.</li> <li>3. Added to common present action.</li> <li>3. Added to common present action.</li> <li>3. Added to common present action.</li> <li>3. Added for PDCA.</li> <li>4. Approval later of C.</li> <li>4. Approval later of C.</li> <li>5. Beduction is deciding in Report on added to the formation activity action at a deciding in Report on the Report</li></ul>	1. Arterior commune improvement action is model to commune improvement action multiple commune improvement action on NV management.       2. Addit to commune improvement action on NV management.         3. Addit to commune improvement action on NV management.       3. Addit to commune improvement of vare full collection is added.         3. Addit to commune improvement action on NV management.       3. Addit to commune improvement of vare full collection is added.         3. Addit to commune improvement action on NV management.       1. A new other . The approval is required by EDWS.         1. Jaking to improvement action on NV management.       1. Abproval for Microscol.         3. Addit to commune improvement action on vare quality management.       1. Abproval for Microscol.         1. Jaking to improvement action on vare quality management.       1. Abproval for Microscol.         2. Meanoral for action and the common action on NV common action on NV common action on NV common action on NV common action on NV common action on NV common action on NV common action on NV common action on NV common action on NV common action of Management.         2. Approval of Microscol.       2. Approval in SC2. or approval in SC2. or approval in SC3. or approval in S	<ul> <li>1. At a region of ontain strong of phil is notified. The approval is required by EDWS.</li> <li>2. 1. At a work on 2. in wynowrenat action with management.</li> <li>3. A dded to continue improvement action on W. management.</li> <li>3. 2. A dded to continue improvement action on W. management.</li> <li>3. 2. A dded to continue improvement action on W. management.</li> <li>3. 2. A dded to continue improvement action on W. management.</li> <li>3. 2. A dded to continue improvement action on with management.</li> <li>3. 3. 4 more of here. The approval is required by EDWS.</li> <li>3. 4 more of Picer (19, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10</li></ul>	<ul> <li>1. And on comme impovement acton.</li> <li>2. 1. And on comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>3. Add to comme impovement acton.</li> <li>4. Anorolate: The approval is required by EDWS.</li> <li>4. Anorolate: The approval is required by EDWS.</li> <li>3. Anorolate: The approval is required by EDWS.</li> <li>4. Anorolate: The approval is required by EDWS.</li> <li>3. Anorolate: The approval is required by EDWS.</li> <li>3. Add to comme impovement action on vare quality management.</li> <li>3. Approval is required by EDWS.</li> <li>3. Add to comme impovement action on vare quality management.</li> <li>3. Approval is required by EDWS.</li> <li>3. Add to comme impovement action on vare quality management.</li> <li>3. Approval is required by EDWS.</li> <li>4. Overification is added.</li> <li>4. Overification is clarified according to OVI.</li> </ul>	<ol> <li>1. Added to continue improvement action.</li> <li>1. 1. In version 2 is moved here and name of plan is modified. The approval is required by EDWS.</li> <li>3. Added to continue improvement action on NKW management</li> <li>4. Added to continue improvement action on NKW management</li> <li>5. 2.4 in version 2 is moved here. The approval is required by EDWS.</li> <li>6. Added to continue improvement action on water quality management.</li> <li>7. 3.4 in version 2 is moved here. The approval is required by EDWS.</li> <li>1.3.4 in version 2 is moved here. The approval is required by EDWS.</li> <li>1.3.4 in version 2 is moved here. The approval is required by EDWS.</li> <li>1.4 No change.</li> <li>1.5 Added for PDCA cycle management.</li> </ol>	1-1 Plan for institutional management is approved     1-1 Plan for improvement of water bill collect       by Yaugon Region Government.     1-2 Plan for improved by Yaugon Region Government is approved by EDWS.       1-2 Plan for human resources development is approved by EDWS.     1-3 Plan for human resources development is approved by EDWS.       1-2 Plan for human resources development is approved by Yangon Region Government.     1-3 Drafts of regulations, standards and	by by <u>1-5 2 full time staff members in PDCA cycle to EI</u> staff.	<ul> <li>1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by Yangon Region Government</li> <li>1-4 New organization structure is approved by Mayor.</li> </ul>	ndicators. onsidering the pilot project on going.	Reason: Version 2 1. Modified to 1. and 3. in version 3. for more specific 2. Moved to Output 2-5 in version 3. and modified c 3. Moved to Output 3-5 in version 3 and modified c Version 3
<ul> <li>America la strate specific indicates.</li> <li>A strate of la st is reacting strate or strate and strates and strates.</li> <li>A strate of la st is reacting strates and strates and strates and strates.</li> <li>A strate of la strate and strates a</li></ul>	<ul> <li>Wanging and an and fast and more fast inductions.</li> <li>Wanging and an and fast and more fast inductions.</li> <li>Wanging and an and fast and more fast inductions.</li> <li>Wanging and an and fast and more fast inductions.</li> <li>Wanging and an and fast and more fast inductions.</li> <li>Wanging and an and fast and more fast inductions.</li> <li>Wanging and and and fast and more fast inductions.</li> <li>Wanging and and and fast and more fast and more fast inductions.</li> <li>Wanging and and fast and more fast fast and more fast and more fast and</li></ul>	Yearsen <ul> <li>Yearsen <ul> <li>Yearsen <ul></ul></li></ul></li></ul>	Yesters       Yesters	Noted to Output 3-5 in version 3 for more specific indicators.       Noted to Output 3-5 in version 3 and modified considering the pilot project on going.       Noted to Output 3-5 in version 3 and modified considering the pilot project on going.         1. Modified to 1. and 3. in version 3 for more specific indicators.       Example services in version 3.       Yangon is approved by Yangon Region         2. Moved to Output 3-5 in version 3.       I. Moved to Output 3-5 in version 3.       Noved to Output 3-5 in version 3.       Noved to Output 3-5 in version 3 and modified considering the pilot project on going.         3. Moved to Output 3-5 in version 3.       I. Moved to Output 3-5 in version 3.       I. Aleve organization structure is approved by Yangon Region         3. Moved to Output 3-5 in version 3.       I. Aleve organization structure is approved by EDWS.       I. Aleve organization structure is approved by EDWS.         Yearson 3       I. Alded to continue improvement action.       I. Aleve organization structure is approved by EDWS.         Yadded to continue improvement action.       I. Alded to continue improvement action on NKW management.         Added to continue improvement action on NKW management.       I. Activity on improvement action on NKW management.         I. Added to continue improvement action on NKW management.       I. A the approval is required by EDWS.         I. Added to continue improvement action on ware quality management.       I. Activity on improvement is required by EDWS.         I. Added to continue improvement action on ware quali	DWS. Before (as version 2) Amended Version (as version 3)	1-3 Drafts of regulations, standards and midalfines for water currely correives in	1-2 Plan for human resources development is approved by Yangon Region Government. 1.4 Drafte of resolutions standards and		construction.

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area.

2-1 The number of persons should be specified in in version 2.	NRW training plan. This indicator is similar to 2-3	<ul> <li>3-5 Moved from 3. of Project Purposes in going.</li> <li>3-6 Added as the O&amp;M system set up is in</li> </ul>	version 2 and modified considering the pilot project on mortant for continuous operation.
2-2 Avo cuange. 2-3 Added as the development of trainers is impou	rtant to extent NRW management to the entire	3-7 Same as above.	
service area. 2-4 The number of persons should be specified in	NRW training plan.	(2) Means of Verification	
(2-4 in version 2 is moved to s moved to 5, of Pro 2-5 This is moved from Project Purpose.	bject Purpose inn version 3.)	Before (as version 2) Reports prepared by YCDC	Amended Version (as version 3) 3-1 S/C3 monitoring report, manuals in relevant
(2) Means of Verification			offices, training record. 3-2 Monthly water quality monitoring report.
Before (as version 2) Reports prepared by YCDC	Amended Version (as version 3)           2-1 Manuals in relevant offices and traiming record.           2-2 Pilot project activity report.           2-3 S/C1 activity record. Evaluation by JICA           Experts based on a check sheet indicating necessary abilities for trainers. The check list to the prepared in the project in advance.           2-4 Training renderance record HRD renort.		<ul> <li>3-3 Evaluation by JLA Experts based on a cneck sheet indicating necessary abilities for trainers. The check list to be prepared in the project in advance.</li> <li>3-4 Training attendance record, HRD report (HRD Section).</li> <li>3-5 Activity report of Taskforce team.</li> <li>3-6 Operation and maintenance organization structure of Lagmbyw water treatment plant.</li> </ul>
	2-5 S/Cl activity record, Pilot project activity	Reason:	3-7 Operation and maintenance organization structure of chlorination facilities.
Reason: Means of Verification is clarified according to OV		Means of Verification is clarified accordin;	g to OVI.
5. OVI and Means of Verification for Output 3 c	of PDM version 2	3-2 Plan of Operation (PO)	
(1) OVI Before (as version 2)	Amended Version (as version 3)	3-2-1 Schedule of PO	
<ol> <li>3-1 Manuals and training materials are fully utilized by more than xx persons of YCDC staff.</li> <li>3-2 Result of the water quality test at the pilot treatment plants is recorded and monitored</li> </ol>	<ul> <li>3-1 Manuals and training materials on water quality management are <u>utilized by YCDC</u> <u>staff.</u></li> <li>3-2 Result of the water quality test by the central</li> </ul>	Based on the delay of activities mentioned the revised schedule of PO was set as show	above and other minor extension of the activities required, n in Annex-2.
periodically 3-3 xx% of YCDC staff participates training on water quality	laboratory and on-site mini laboratory is recorded and monitored periodically. 3-3 The mmber of trainers for water quality	4 Preparation by YCDC side toward	l after completion of the Project
3-4 Plan for improvement of water quality is approved by YCDC	<ul> <li>management becomes 4.</li> <li>3-4 FDWS staff participates in training based on training plan for water quality management.</li> <li>3-5 The turbidity of treated water in pilot sand filter in Nyaunghnapin water treatment plant is controlled less than 1 NTU.</li> <li>3-6 The operation and maintenance system of Lagunbvin water treatment plant is prepared.</li> <li>3-7 The operation and maintenance system of chlorination (facilities is menanced)</li> </ul>	YCDC side should confirm to operate and the Project	l continue a PDCA cycle management after completion of
Reason: 3-1 The number of persons should be specified in indicator is similar to 3-3 in version 2. 3-2 The indicator is more specified. 3-3 Added as the development of trainers is impor	water quality management training plan. This trant for more EDWS staff t to practice water quality		
management. 3-4 The number of persons should be specified in version 2 is moved to 7. of project Purpose in	water quality management training plan. (3-4 in version 3.)	Ri B	
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Appendix-1: Summary of Project Risk

Risk increase ar decrease		Decreased after peaceful election.	No change	No change	No change	No change		No change	No change	No change	No change
Risks identified		At this time, deterioration in security or political condition has not identified. The results of the presidential election in 2015 have not shown any deterioration of security or change of major government policy to water supply sector.	The previous government considers that water supply sector is a priorized area. After the election such policy remains same. However, there may be a risk of significant change of contents or suspension of the Project due to the policy change by change of government or chier trassons.	There is a risk that not enough commitment by the Project implementing agency to the Project will not be obtained because of the budget curback or personnel relocation in Yangon Regional Government (YRG) and YCDC due to policy change by change of government or other reasons.	The possibility to fail to comply with local laws and regulations on the eariying in the Project is not foreasen. However, the Project should be implemented by checking the consistency of newly developed scheme / regulations in the Project with local laws / regulations and responsibility and necessary process in Myanmar side on approval for several documents requested by the Project.	Other donots or private companies are considering implementing business in water supply seator in Yangon. It is assumed that YCDC may increase investment to large extent using fund of other donots or private companies. As a result, there may be a risk that such huge investment may affect financial condition of YCDC, which may affect self-sustaining development of YCDC. For this counterneasure, chinical assistme for financial management is included in the Project.		As described in the section of "Overall management", there is a risk of the change of overall goal, project purposes and outputs due to policy change of the YRG, YCDC or Government of Myanmar (GOM).	Waterworks of YCDC is not managed by a self-supporting accounting system. Budget for waterworks is allocated through YRG and YCDC. There is the risk that appropriate budget will not be allocated to the waterworks in YCDC. Therefore, the underakings of YCDC were used in the R/D tracend of discussion). Furthermore, as for the items that require budget, the follow-up assistance should be made by the Project to allocate budget for these items in the next year's budget requirer in October as main budget or sumplementary budget.	There are many activities in this projects which YCDC has not experienced heiror. Therefore, scatual progress of the Project is unpredictable. It was considered in PO that main activities will start after priority activities and scope of espacity development are narrowed down based on the results of baseline survey and capacity assessment implemented in the early stage.	If procurement of equipment was unsuccessful, the Project will delay. Therefore, measures to avoid unsuccessful bidding shall be made and procurement process should
Risk in project implementat ion		Yes	Yes	Yes	Unknown	3		Yea	Yes	Yes	Yes
Envisioned risk	Overall management	Project interruption due to the deterioration in the security situation or political condition.	Significant change or interruption of project due to the policy change of recipient government.	Difficulty in continuation of Project implementation because of the jack of commitment and ownership by recipient government or project implementing agency.	Failure to comply with related laws and regulations	Existence of obstructive factors of feel Fastratining development after completion of the Project	Scope management	Change of overall goal, project purpose and outputs due to policy change of recivient government.	Change of overall goal, project purpose and outputs due to <u>delary of</u> <u>implementation of</u> <u>implementation of</u> <u>implementation accurv.</u>	Change of overall goal, project purpose and ontrputs due to an insufficient capacity of truplementing agency	Change of overall goal, project purpose and outputs due to delay of

Risk increase or decrease		No change	AfD will start NRW project. It should be watched carefully.	No change		No change	No change	No change		No change	No change	San San San San	No change	No change
Risks identified	have enough time.	Regular progress monitoring and follow up will be made. In addition, knowledge of waterworks of Japanese local governments (Tokyo Metropitan and Fukuoka City) should be utilized in the Project.	YCDC is approached by many donors and private companies. Threefore, it is necessary to monitor their activities carefully. Note: AID; French Development Agency	There is the risk. Therefore, the undertakings of YCDC should be confirmed in the R/D (Record of discussion). Furthermore, as for the items that require budget, the	required cost should be estimated and the follow-up assistance should be made by the Project to allocate budget for these items in the next year's budget request in Orobber	There are many activities in this projects which YCDC has not experienced before. Therefore, actual progress of the Project is unpredictable. It was considered in PO that main activities will start after priority activities and scope of capacity development are narrowed down based on the results of baseline survey and capacity assessment innolmement in the early stave.	If procurement of equipment was unsuccessful, the Project will delay. Therefore, measures to avoid menocaseful during shall be made and procurement process should have enough time.	Regular progress monitoring and follow up will be made. Bleause of the wide range of project scope, monitoring is implemented carefully to prevent a delay due to shortage of manpower of experts.		The undertakings of YCDC should be confirmed in the R/D. Furthermore, the follow-up assistance should be made by the Project to allocate bludget for these items in the next year's bludget request in October a supplementary budget and next fiscal bludget.	1		There are many activities in this projects which YCDC has not experienced before. Therefore, actual progress of the Project is unpredictable. It was considered in PO that main activities will start after priority activities and scope of capacity development are narrowed down based on the insults of baseline survey and capacity sassessment implemented in the early stage. In addition, it is considered an expert of Institutional Capacity Development / Human Resources Management is assigned in the Project to support establishment and discemination of rechnology acquired through the Project in YCDC.	To supply safety and enough quantity of water to the initiant, it is necessary that the transferred technology through the Project is fully utilized by securing necessary budget toy YCDC, implementing practive facility development, NRW reduction and water quality management in the Project, planned support to utility management will be made or realize sustainable
Risk in project implementat ion		Yes	Yes	Yes		Yes	Yes	Yes		Yes	No	1. S. C.	Ycs	Ycs
Envisioned risk	implementation of undertakings by Japan.	Change of overall goal, project purpose and outputs due to capacity of the experts.	Change of overall goal, project purpose and outputs due to the difference between prior condition and actual condition.	Schedule management Delay of implementation of each activity due to the delay of implementation of	<u>undertakings by</u> implementing agency.	Delay of implementation of each activity due to the capacity of implementing agency.	Delay of implementation of each activity due to the delay of undertakings implementation by Japan.	Delay of implementation of each activity due to an insufficient ability of expert.	Cost management	Deficiency of budget for responsibility of implementing agency	Deficiency of budget for responsibility of Japan	Quality management	Decrease of output due to an insufficient capacity of insufficient capacity of implementing agency	Decrease of development impact to final beneficiaries.

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Envisioned risk	Risk in project implementat ion	Risks identified	Risk increase or decrease
		development impact.	
Decrease of development impact due to absence of expert's manpower or active period.	Yes	This project is planned to assure enough amount of M/M of experts. However, if additional manpower is required, input of additional M/M should be considered.	No change
Decrease of development impact due to an insufficient capacity of expert.	Yes	This project put the right person in the right place considering the experise of consultant and waterworks personnel (Tokyo Metropolitan and Fukuoka City). However, if the inutflicient capacity of expert becomes apparent, replacement of expert is considered.	No change
Management of human resource	Section 2		
Delay of assignment C/P or change of C/P	Yes	Counterparts (C/P) are assigned from existing personnel in YCDC. Therefore, new employment for this project is not assumed. The required number of C/P and technical field are agreed in the detailed planning survey.	No change
Delay of dispatch of expert	Yes	If the procurement of consultant is unsuccessful, dispatch of expert is delayed. Therefore, implementation of process management with margin and countermeasures to avoid unsuccessful tender should be considered.	No change
Difficulty of securement of annronriate exnert	Yes	Based on the routine project monitoring, assignment of consultant and revision of contract are considered.	No change
Management of Communication			
Difficulty of communication among recipitent government, project implementing agency and involved parties	Yes	Currently, a number of ODA projects are implemented in Yangon city. Communication between project implementing agency and involved parties is currently satisfactory. Howeve, YRG and OOM duri Liave a comprehensive responsible unit on waterworks maagement. Therefore, communication with YRG and GOM is limited.	No change
Difficulty of communication with Japanese concerned parties.	Yes	A lapanese concerned party is constituted of JICA. Tokyo Metropolitan, Fukuoka city and Consultant. Therefore, maintain of close communication among these entities is important	No change
Management of procurement			
Delay of equipment procurement	No (Change to Yes)	Specialized equipment and equipment with long production period are not planned. Therefore, delay of equipment procurement is not expected.	There is a risk. Delay in procurement process of equipment.
Delay of preparation of technical training	Yes	In the Project, a schedule with enough time to select an appropriate candidate and to implement necessary procedure in Myanmar should be considered.	No change
Other risk	Not identified		

Annex

Annex-1: Monitoring Sheet Version 5 Annex-2: PO Version 6 (Modified Schedule)

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FO Act	ity No.		Term1	L.			Term	2		Progress and Achievement as of September 2018
-	A Description of the second second second second second second second second second second second second second	2015	2016	-	2017	2018		2019	2020	
1-6	Enhance understanding or financial management.						1			A second s
	1-6-1 Analyze the current financial management system									Completed ention-going. A continuous updetling and exploring the existing financial management system are being implemented.
	Implement training on financial management for the sustainable 1-62 operation of water supply service in consideration of future development plans	-								On-going: Lecture series of sustainable management and vater taxiff setting were implemented, Corporate accounting system, water landf setting and asset accounting a new bling exercised.
1	1-6-3 Conduct CJT on development of asset ledger		-	-	_	-	-			Asset edger and fixed asset accounting system is being diveloped by the committee
1.7	Strengthen Public Relations						-			rawy xyanizat.
1	1-7-1 Analyze the effective public relations on water service of "CDC									Completed, Activity pan of PA was prepared.
1	1-7-2 Conduct awareness raising of YCDIC staff			-			-		-	Annua collendar was Sstributed for 2017 and 2018. School awareness program were
1	1-7-3 Conduct CJT on the public relations activities			-						On-going. Calendar distribution and school awareness program will be continued.
1-8	Strengthen human resources development									
	1-8-1 Review the existing human resources development system									Completed.
	1-8-2 Identify necessary improvement on structure and materias of the trainings	-		-						Completed.
1	1-8-3 Conduct trainings of trainers for planning and organizing the trainings									On-going. Training foritrainers and training management by HRD section have been
	1-8-4 Develop 5-year and 10-year human resources development plans			-						Under preparation. A comprehensive training program is unler formulating.
	1-8-5 Launch priority adjivities as a part of implementing the 5-year human resources development plan								-	On-going. Some highly prioritized activities have been implemented such as training for new all #, PC skills, basic theory of water engineering, SS activities and capacity development for HPID Section.
1-9	evelop and support implementation of the institutional management plans									
	1-9-1 Develop 5-year and 10-year institutional management plans			-			_			On-going, S/C2 br mbl-term sien has been keld and draft ist mid-term plan for 2018-20
	1-9-2 Launch priority activities as a part of implementing the 5-year Institutional management plan									Not ye started. The activities will start after insizing mid-tim plan.
hutput 2	Capacity of YCDC on NRW management is improved.					1	1			
2-1	Establish NRW Management Unit									
1	2-1-1 Establish NRW Nanagement Unit					i anniun				Completed and started work (Established in Jan, 2017).
1	2-1-2 Define the division of duries of NRW Management Unit									Completed.
2.2	Collect and compile information of NRW						-			
	2-2-1 Collect information of NRW and implement a baseline survey			-						Completed and updating.
	2-2-2 Compile information of pipes for establishment of GIS	-		•						Completed and updating. Information regarding the past prips improvement project was completed. Completiondrawings for new projects (Meyangone and Lagunbyin) will be prequend in a timet of GIS, Procedure of updating of collected data in GIS is under examination.
1	2-2-3 Compile customer information into database									Completed and updating.
1	2-2-4 Formulate Standard Operation Procedure (SOP) of the above						-			On-gsing, SOPs are under preparation,

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Annex-1: Monitoring Sheet Version 5 The Project for Improvement of Water Supply Maragement of YCDC Plan of Operation (PO) ver 5

Pian	or Operation (PO) ver.5	r									free contractions and the second second
POA	Activity No.	1		Term 1		Sch	ledule	Term	2		Progress and Achievement as of September 2018
-		2015	-	2016	1	2017	2018		2019	2020	
Prepar	ation of Work Plan Phase 1 (Draft) and Monitoring Sheet Ver,1 and Discussion	annec	-		1			T			Completed
Prepar	ation of Work Plan Phase 2 (D aft) and Monitoring Sheet Ver 4 and Discussion					-	11	1			Completed
Basein	ne Survey (Implementation of Capacity Assessment	-			-		(ma)		-	-	Completed.
Confirm	nation of Work Plan and Monitoring Sheet Ver.1		Δ		1			-			Completed
Sticke	auch or wentedring Sheet Ver.2~ ver.5					-			A _ A	Δ	The Monitoring Sheets Version 1 and 5 were prepared. Completed 2 this country trainings for NRW management and water cieffic management
Gui	a naming masterin and the sound and importanticipt.				-	-		-			and 1 Iraining in Apan were implemented in Cambodia in Term 2.
Sauy	or materias to be produced and their procurement	-		and the second second second second second second second second second second second second second second second	-	1		-		-	monitoring system, 2) NRW pilot project, 3) NRW training yard.
Prepar	alion of project progress report	-	-		12		Δ		Δ		Progress report of ferm 1 was prepared in March 2017. 1st Progress report of Term 2 was prepared in May 2018.
Endlin	in Survay	-	-		-		-	-		-	Not yet
Propar	alice of project completion repart		-		-			-		- Andrews	Not yet
Outpu	It 1: Capacity of YCDC on Institutional management is improved.				1.		1	1			
1-1	Prepare overall new organization structure		-								Completed.
1-2	Establish Planning Section							1			
	1-2-1 Establish the Planning Section in Department of Water and Sanitation		-		-						Completed (but nc kill time staff).
1	1-2-2 Deline the dviston of duties of the Planning Section		-								Completed.
1-3	Establish Customer Service Division							10.1			
	1-3-1 Establish the Customer Service/Division in Department of Water and Samitation		-								Completed.
	1-3-2 Deline the divisional duties of the Customer Service Division		1.1							181	Completed.
	1-3-3 Establish operation system of the Custemer Service Division										Under implementation, Existing stuation of customer service in TIS and e-Government system was studied. A new customer database has been proposed. The new billing and collection systemia now under preparation. In addition, efficiency and optimization of the system are underbline.
1.4	Develop and Monitor Performance indicators (Pis)					1					Sharrow and the second state
	1-4-1 Review the curren method of calculation and monitoring of performance data		-	•	-		1				Completed.
	1.4.2 Conduct fraining of trainers on the celculation and monitoring of Performance indicators.		-					-		-	Completed. Pis of 2016 went calculated and training of Pi calculation was given.
	1-4-3 Identify the necessary and available Performance Indicators to be momilared	-			-						Completed. Pis, IPIs and MKPIs are set up and Pis monitoring system was propered. Available Pis have been monitoriel and data accuracy has been improved.
	1-4-4 Install transmission llow meter and data logger and collect flow data				-			-	-		Flow monitoring system is now usder procurement and it will be completed in March 2019.
	1-4-5 Procure equipment (computers, printers, software, etc.) in boal offices and conduct training		1000			0					Completed. 72 sits of PC were procured and used for operation and PC training.
	1-4-5 Collect data required for setting Pts.		-		-		-	-			Completed. Data is now collecting continuously except fow data, which will be collected from the propose flow mentioning system.
	1-4-7 Develop calculation method, manuals and monitoring system of Performance indicators		_		-						Completed. The nonlining system is being improving by using a new format for T/S office to collect more accurate date.
	1-4-8 Calculate Performance Indicators		-		-						Completed. Pls were calculated except NRW rate, for which completion of flow monitoring
	1-4-9 Update and monike the Performance Indicators periodically										MKPIs for FY2010 was calculated and those for FY2017 is under calculation. Pils, KPIs and MKDIs are particularly updated
1-5	Formulate regulations, standards and guidelines	1			1			1			and the second se
1	1-5-1 Review the existing rules, regulations, standards and guidelines				1		1				Completed.
	1-5-2 Identify regulation, standards and guideines to be modified ad/or rewly formulated	1	-								Necessary over ire identified and started formulating.
	1-5-3 Draft water supplyregulation and run a Irial					-	1				The preparation or water supply regulation started in S/C3 in autumn, 20/7 by establishing working group. Then, 2 stogroups were set up in summer, 20/6 and detail diacussion was started regarding happy risuse fits water supply squipment and artiff colection. In Statistics of the momentum statistics of the statisti
	1-5-4 Draft necessary regulatios, standards and guidelines, which can be prepared by YCDC			-	-			-			Nocessary ones are identified and started formulating.

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	CONTRACTOR CONTRACTOR AND INCOME.		and the second se				1		project and tata collection and assessment, trainers are being trained.
	Conduct trainings of trainers through implementation of Non-revenue water (NRW) pilotprojec in North Okkalapa			-		-	*********		Survey, plaiming and desigs (drawing), flow measurement and NKW ratio estimation were completed through OJT. This OJT process is a kind of trainers training.
	2-3-3 Prepare training pan and training materials by the trainers	-				_			On-going. The training plan and materials has been prepared and raining is under implementation.
	2-3-4. Formulate manuas on physical loss								On-poing. Menuals are being preparing in S/C1.
	2-3-5 Conduct Olf-JT by the trainers								Not yet started.
	2-3-6 Select a plot areas for NRW management activities								Completed. Yankin 13-ward was selected)
	Prepare action plan and procurement of equipment iteakags survey and 2:3-7 repair) for the countermeasure to be taken for physical loss in the pilot area	-							Equipment vas under procversent by JICA HQ' and it is celayed.
	2-3-8 Set up DMAs at the pilot area (including procure materials and construct DMA)	-				-			Not yet started due to delay of procurement of equipment.
	2-3-9 Conduct the countermeasures against physical loss in the sliot area								Not yet slated due to delay of procurement of equipment.
	2-3-10 Evaluate ccs1-berefit of countermeasures against physicalloss of the pilot area and formulate the optimal model of activities								Not yet stated due to delay of prosurement of equipment.
	2-3-11 Implement OJT by the trainers								Noi yet slated
	2-3-12 Verify the manuals on physical loss								Not yet started
2-4	Develop a model on the management of commercial (non-physical) bas (meter fault, miss reading of meter illegal connection) and human resources development								
	2-4-1 Review current situation and develop phased countermeasures					_			Review of current situation was completed. Phased countermeasures are under examined in S/C1.
	2-4-2 Conduct trainings of trainers					_			On-going. Mater survey (existing and condition) is under implementation in the entire city.
	Conduct transings of trainers through implementation of Non-revenue water (NRW) pilotprojec. In North Okkalapa							Sec	Survey, planning and dasigs were completed through CUT and assistance for supervision i under implementation.
	2-4-3 Prepare training pan and training materials by the trainers					_			On-going. The training plan and materials has been prepared and training is under implementation.
	2-4-4 Formulate manuas on commercial loss								On-going. Manuals are being preparing in S/C1.
	2-4-5 Conduct Off-JT by the trainers					-			No: yet a laned.
	Prepare action plan and procurement of equipment for the 2-4-6 countermeasures to be taken for commercial loss in the selected pilot area	-				-			Equipment was under processment by JCA HO and it is cetayed:
	2-4-7 Conduct the counermeasures against commercial loss in the pilot area								Not yet started due to defay of procurement of equipment.
	2-4-8 Evaluate cost-benefit of countermeasures against physicalloss in the pilot area and formulate the optimal model of activities								Not yet stated due to delay of procurement of equipment,
	2-4-9 Implement OJT by the trainers in the plot area				in the second second second second second second second second second second second second second second second	_			Nol yet stated
	2-4-10' Verify the manuals on commercial loss				-	_			Not yet stared
2-5	Develop training yard for NRW management					-			
	2-5-1 Prepare training pan for raining yard							and the second se	Completed.
	2-5-2 Design training yard				-				Completed.
	2-5-3 Prepare equipment and materials for training yard					-			On-going, Tender documents are under preparation assisting JICA Head Office.
	2-5-4 Construct trainingyard					-			Nol yel slared.
	2-5-5 Prepare training nanuals and materials for training yard and conduct trainings of the trainers in training yard								Not yet stared
	2-5-6 Conduct OIIIT by the trainers in training yard	and the second se							Nol yet stared.
2-6	Develop and support implementation of the NRW management plans								
	2-6-1 Develop 5-year and 10-year NRW management plans								On-going. The plan is under formulating in S/C1.
	2-6-2 Launch priority advities as a part of implementing the 5-year NRW management plan				· · · · · · · · · · · · · · · · · · ·				Nol yet stared.

Schedule

Term 2

2013

2020

2018

Progress and Adhievement as of September 2015

Salaw of correct situation was completed. Phased countermeasures are under examined n SCI. Second services fixed teaching and the second secon

2017

PO Activity No. 2017 Tern 1 2016 Term 2 Progress and Achievement as of September 2018 2015 2018 ¥ 2019 2020 Output 3. Capacity of YCDC or water quality management is improved. 3-1 Establish Water Treatment Section Exablem Water instanted Section 3-14 Establish Me Viter Treatment Section in Department of Water and 3-15 Define the division of Aulies of the Water Treatment Section 3-13 Hold as sets of serving for this text water treatment factorology with 3-14 Study source in treatment facilities ---mpioted. ----mpieled. mileted and continuously being held. 3-2 Review current situation and formulate phased countermeasures mplated. 3-3 Conduct training of trainers on water quality management 3-3-1 Conduct training of trainers on the water quality management -geing -3-3-2 Prepare the training plan and training manuals by the trainers n-geing. 3-3-3 Conduct Off-JT by the trainers in-geing. 3.4 Develop SOP for water quality management 
 3-4-1
 Develop SOP or water quality test and monitoring

 3-4-2
 Develop SOP or operation and maintenance of water treatment plant & disinfection facility

 ConstAct OJT on water quality management at the plot treatment plants and disinfection facility
 Sector Software and the plot treatment plants and disinfection facility

 3-6-7
 Constact OJT on water quality leads and water quality management at the plot treatment plants and experiment plants and water quality management at the plot treatment plants and experiment plants and water quality is and water quality management at the quality management at the quality management at the plot treatment plant at a disinfection facility is an and the quality management at the quality management at the quality management at the quality management at the quality management at the sector of the quality management at thequility management at thequility management at the 3-4-1 Develop SOP or water quality test and monitoring maleted and updating. ...................... on-geing. SOPs of "egu disinfection facility are prepared 3-5 ompleted. omplated. Almost completed. "est is continuing by plot basin. The plan is under preparation; On-gains; DJF of OAM of Yoyu chloritetios facilities was complexed: OJF of O&M of WITP is under implementation. OJF of O&M of chloritetions facilities ather them Yegu has not yet catetat. 3-5-7 Verify SOP for water quality management Not yat started. 3-6 Conduct OJT on improvement of water quality supplied from reservoirs 3-6-1 Review water quality problems in reservoir water 
 3-6-2
 Reservit water quality improvement measure of eservit suppled water

 Develop and support implementation of the water quality management plans
 tesench was completed and improvement measures arounder compliation. 3.7 3-7-1 Develop 5-year and 10-year water quality management pans Not yet started. 3-7-2 Launch prontly activities as a part of mplementing 5-year water quality management plan Vol yet started. A JCC7 JCC8 ∆ JCC9 Kick-off Meetings, JCC, or other meetings JCC6 JCC1 JCC4 JCC5 Kick-off JCC2 JCC3

Schedule

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PO Activity No.

2-3 Develop a model on the managem human resources development

2-3-2 Conduct trainings of trainers

a model on the management of physical loss (leakage, overflow) and

2-3-1 Review current situation and develop phased countermeasures

.... Main activities Monitoring or minor activi

Term 1 20'6

Annex-2: PO Version 6 (Modified Schedule) The Project for Improvement of Water Suppy Management of VCDC Plan of Operation (PO) ver.6

					P	ŝch	adule					
PO No	Mity No.	SMC	Term1	Ī	-	She7	-	SHUC.	Term2	suc		ucue.
Prepara	ion of Work Plan Prase 1 (Draft) and Montoring Sheet Ver.1 and Discussion	1			-		_	<	1			
Prepara	ion of Work Plan Phase 2 (Draft) and Monitoring Sheet Ver 4 and Discussion				1							
Baseline	Survey ((mplementation of Capacity Assessment)			1	1		1					1
Confirm	ation of Work Plan and Monttoring Sheet Ver.1		۵ ۲		+		•		T	~	X	×
Study of	training in Jupan and third country and implementation						:					
Study of	materials to be procured and their procurament	L		t	+			t	t	I		
Prepara	on of project progress report				A		1			Þ		
End fire	statutay see al andrest committee second				+		_	1	T			1
Output	on or project companion report. 1: Capacity of YCDC on Institutional management is improved.				-			1				
5	Prepare overall new reganization atmicture				T			-				
1:2	Establish Planning Section				-							
	1-2-1 Establish the Planning Section in Department of Weter and Samitation			T	1							
	1-2-2 Define the division of duties of the Plenning Section				T							
1.3	Establish Customer Service Division				-							
	1-3-1 Establish the Customer Service Division in Department of Water and		İ		-							
	version topic 1-3-2 Define the division of dudes of the Customer Service Division				:			1	1			
	1.5.3 Establish nowzałch sustam of the Customer Sarvice Diotsion				-				T			
3				1				Ì	t			1
T	Devecto and investment restructure ce expression (r la) Review the current method of calculation and monitoring of				-			1	1			
	performance date Conduct training of trainers on the calculation and monitoring of			1	+			T	T			
	14-2 Performance indicators. Identify the necessary and available Performance indicators to be				+						No service	
	monthrod	I		t	i							
	1-4-4 Install transmission flow meter and data togger and odiect flow data							I	Ħ			
	14+5 Procure equipment (computers, printers, software, etc.) in local offices and conduct training			T	T			-	1			
	1-4-6 Collect data required for setting Pis			t	┢			T	t	Ì		
	141-7 Develop calculation method, manuals and monitoring system of Performance indicators			I	i		-					
	1-4-8 Calculate Performance Indicators				i		-		-			-
	1-41-9 Update and monitor the Performance Indicators periodically		2.1		-		-		:			
2	Formulate regulations, standards and guidelines				-							
	1.6-1         Review the existing rules, regulations, standards and guidelines.           1-5-2         Identify regulation, standards and guidelines to be modified and/or newly.				-		-					
	Deservuid							1	t			
	-co-d. Creat water supply regulation and fundaments											
	1-5-4 Lifet recession y regulation, standards and guiderines, which can be prepared by YCDC		1		$\left\  \right\ $			T	T			
9	Enhance understanding on financial management				-		_					
	1-8-1 Analyze the current financial management system				-		-					
	Implement training on financial management for the sustainable 1-5-2 operation of water supply service in consideration of future development plane	L			-							
	1-6-3 Conduct OJT on development of asset ledger				+			t	t			
1-1	Stengthen Public Relations				-							
	1-7-1 Analyze the affective public relations on water service of YCDC	1										
	1-7-2 Conduct awareness raising of YCDC staff		1					T	T			
	1-7-3 Conduct OJT on the public relations activities		1	T	-			İ	t			
1-6	Strengthen human tesources development											
	1-8-1 Review the existing human resources development system				-		-					
	$\tau_{\rm eff}$ life-nity recessing improvement on structure and matarials of the transition				T							
	1-5-3 Conduct trainings of trainers for planning and organizing the trainings				i		-	-	:			
	indeal. Develop-Organiand 10-gen faunani renourves developiniani piena				Ш			1		1		
	1.8.6 Learnch priority solivities as a part of implementing the 5-year human resources development plan				-			T	T			
1-8	Develop and support implementation of the institutional maragement plane				-		_					
	1-9-1 Develop 5-yeer and 10-yeer institutional management plans. Lawoch oncolaturationana ar a narr Af inclamanicon tha Survey				-		-	T	i			
	1-9-2 Institutional management plan						_	*				

POA	Star IS		Termi		Schedule	Ter	240		
	and the second se	2015	2016	2017		SOTO Y	2019	T	2020
Outpu	2. Capacity of YCDC on NKW management is improved.					-			
2.1	Establish NRW Management Unit					-		-	
	2-1-1 Establish NRW Management Unit					-		-	
	2-1-2 Define the division of duties of NRW Management Unk								
2.2	Collect and compile information of NRW					-			
	2-2-1 Collectivitorination of NRW and implemental basefine survey				*****				
	2:2:2 Complie information of pipes for establishment of GIS								
	2-2-3 Compile customer information into database								
	2-2-4 Formulate Standard Operation Procedure (SOP) of the above								
2.3	procreation management. Develop a model on the management of physical loss (leafage, over flow) and					-		T	T
	human resources development							1	
	2.3.1 Revenue current adjustero and clausiby phasael rounteemescures							1	
	2:3-2 Conduct trainings of trainers								
	Conduct trainings of trainers through implementation of Non-revenue water MRW1 statt protect in North Oldanase					┢		1	
	2-3-3 Prepare training plan and training materials by the trainers				_			1	
	2.2.4 Entrudate metricale on obtained base							1	
	0.0 E. Donadicki OM. The film hereine							T	
	and a second sec					-		T	
	Propere action plan and produrement of equipment (religned)					-			
	2-5-7 regard for the countermeasure to be taken for physical case in the plot area						+		
	2-3-8 Set up DIMAs at the plot area (including procure materials and construct DIMA)	11				╢		-	
	2-3-8 Conduct the countermeasures against physical toss in the plot area					+	İ		
	Fusibility contributed of countermeasures analysis of the					+			
	2:3:10 minutes concrete the continue in order of activities					+		ſ	1
	2-3-11 Implement OJT by the trainers				_			tl	
	2-3-12 Verify the manuals on physical loss			_				I	1
2	Develop a model on the management of commonsial (non-physical) loos (motor fault, miss reading of motor, flegal connection) and human resources								
	0 development 2-4-1 Review current situation and develop phased countermeasures					+		T	
	24-2 Conduct trainings of trainers					╢		t	I
	Conduct trainings of trainers through implementation of Non-devenue					+			
	water (NRW) pilot project in North Okkalape	ľ			-	╫	1	1	
	2-1-3 Propare training plan and training materials by the trainers					+		Π	
	2.4.4 Formulate manuals on commercial loss					┝		ī	1
	2-4-5 Conduct Off-UT by the trainers					╀		t	
	Prepare action plan and procurement of equipment for the 2.4.6 countermeasures to be taken for commercial loss in the selected pilot area	r				1	-		
	2-4-7 Conduct the countermeasures against commercial base in the plat area							-	
	2.1.6 Evaluate cost-benefit of countermeasures against physical loss in the evaluate one to the second size on a second of a second size of the					+	1	T	
	2-1.0 Implement O/T by the trainers in the pilot areas				1	+			
	2-4-10 Verify the manuals on commercial loss					+		H	1
2.5	Develop training yard for NRW management					+		-	
	2.5.4 Diseases trainings when for trainings used			1		-		-	
	David Bismann (of the Bismann souther).					+		1	
	2-5-2. Design training yard							-	
	2-5-3 Propare equipment and materials for training yard					╉	1		
	2-5-4 Construct training yard					Ľ		1	
	2-5-5 Prepare training manuals and materials for training yand and conduct trainings of the trainers in training yand				-	-		11	
	2-5-16 Constituted Offic, If by the trainees to training yard					-		ļ	1
2-6	Develop and support implementation of the NRW management plans					-			
	2-6-1 Develop 5-year and 10-year NRW maragement plans					$\left  \right $			
	2-6-2 Launch priority activities as a part of implementing the 5-year NRW					-			1
	time/industrieum			1		•			

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Vite. Turmi Schedule Termi Schedule Termi 2019 2019 2019 2010	- 0	
Capacity of YCDC on water quality management is inproved.		
atish Weer Treatment Section		
(i) Echtkin fer Weier Themenet Suction in Department of Weier and Section in Department of Weier and Section in Department of Weier and		
L12. Date as a divisor of dates of as When Treatment Staction	MINUM	ES OF MEETING
13. Taking terminen unternamen menutimm autoriongi met	OF THE SEVENTH JOIN	<b>F COORDINATING COMMITTEE</b>
des contentismiento and brimkale presed continimentatives duct labring of tabless on valade galabh menagement		ana ana ana ana ana ana ana ana ana ana
241 Corotat traning of tantens on the water quarky management		WALL NO.
22 Prepare the taking plan and tearing manuals by the tenens	"I he Project for Improvement	of Water Supply Management of YCDC"
3 Conduct Ok/T by the tablets		
top SOP for water guality management	Based on the Record of Discussions (R/D	)) on the Project for Improvement of Water Supply
<ol> <li>Develop SOP on water quality text and morthering</li> <li>Develop SOP on operation and morthering</li> <li>Develop SOP on operation and invariant paint is</li> </ol>	Manaoement of VCDC (hereinafter refer	redmentant of the Project" signed on 25th Noviender
<sup>24</sup> der freichen bischte usei OLT en waar qaartig van gebraarden te piet heart met der sone der sone der sone der sone der sone der sone		
clien facilities Procus water quality analysis and water quality management	2014 between Yangon City Development	Committee (hereinafter referred as "YCDC") and
2 Conduct O.T on water quarky test and monitoring	the Japan International Cooperation Agence	cy (hereinafter referred to as "JICA"), and amended
Degraces function of treatment processes of Neurophrephin weer sectioned plant	on 5th May 2017 and 19th September 2018	, JICA has dispatched the Expert Team to Myanmar
Deebog misooremist measures of function of Masurgimesian weak a meanment plant timough pobl beets	for implementation of the Project since 4th	July 2015.
6 Prepare an impower est pen of Nyaurghreeph water teament paint		
Contact CUT on comparison and maintenance of water treatment plant &		
7 Naty SCP for water gualty management	The / " meeting of the Joint Coordinating (	committee (nerematier referred to as "JUC") for the
uct GUT on insponentent of water quality supplied from reservoirs	Project chaired by the Secretary of YCDC	was held on 1st March 2019.
1 Review weak quality problems in reservoir water		
2. research weitr quary impowenterit measure of treater or a upped	The following agenda was presented ar	id discussed among the participants of the JCC
		and to mindfaund an Grand and a state
Levels 2-year and quary management parts Lucost 2-year and quary management parts common data with the set part of ingenerating 5-year water quarks	meeting including the counterparts of	Engineering Department (Water and Sanitation)
measurements A, DC α Share and Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ	(hereinafter referred to as "EDWS") of YC	DC, JICA Myanmar Office and JICA Expert Team.
ad lides • • • • • • • • • • • • • • • • • • •	<ol> <li>Prospects of project success by e</li> </ol>	ach section
	<ol> <li>Review of previous recommenda</li> <li>Overall progress of the project, a</li> <li>Summary of prospects of project</li> <li>Recommendations and conclusio</li> </ol>	tions and progress nd issues to be shared success and discussion ns
	In the course of discussions, main po Attachment 1.	ints discussed and decided are summarized in
E)		Yangon, 6th March 2019
	(Jacob) Gunich.	·
	Ac Mr. Hirotaka Sato	U Aung San Win
	The Project for Improvement of Water Supply Management of YCDC	Field of Department, Department of Engineering (Water and Sanitation), Yangon City Development Committee (YCDC),
		The Republic of the Union of Myanmar

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Attachment 1: Main points discussed and decided

# 1. Review of previous recommendations and progress

The conclusions and recommendations of previous six JCCs and their progress were reviewed.

# 2. Progress of the project, and summary of issues and discussion

Assistant Chief Engineers and recognized by all participants. The challenges and The progress of the Project and summary of prospects of project success were explained by ALC: NO.

Output	-	Challenges	1	Countermeasures
1-1 Planning		Number of Planning Section Staff	•	Requested for new staff of planning
and		are not enough		section to Head of Department
Regulations		P1 Data and Sub-format data sheet	٠	PI Data and Sub-format data sheet will
		collection are not in time regularly		quarterly be collected by official letter
1			_	and at the half monthly meeting
	_		•	Re-arrangement of PI data collection
			-	system will be considered to optimize the
	_		2	system
				Need to collect and compile Standards
				and Guidelines of other working groups.
	_		٠	Need to know updated policies and
	_			decisions, since YCDC is transforming
				into new organization.
1-2 Finance				To need coordination with every division
and Water				and every section to implement activities
Tariff				of the Project of the Finance Group
1-3 HRD				To need to discuss and propose human
				resource development (HRD) plan for
				sustainable HRD system
1-5				Need to assign the specific duties of
Customer				Customer Service Section as soon as
Service				possible
				Need to formulate RGSMs for Customer
				Services such as application acceptances,
				meter readings, income management,
				outstanding management
				Need to provide continuous support for

Output	Challenges	Countermeasures
		the successfully formulation of Customer Service Section
2 NRW Management	<ul> <li>The Mid-Long Term Plan is absolutely the challenge against issues relating to NRW.</li> <li>We will do a lot of implementation works to reach the NRW Reduction target according to JICA Master Plan 2040</li> </ul>	<ul> <li>Need to have the active participation of all sectors on NRW reduction roadmaps making their sacrifice</li> <li>Uncertainty to anticipate for public Private Partuership</li> <li>Need to enhance the public awareness program and promote the public cooperation</li> </ul>
3 Water Quality Management	<ul> <li>Developing SOPs for new disinfection facilities and Lagunbyin WTP (based on the project schedule of construction stage)</li> <li>Designing Demonstration WTP using Direct Filtration Method &amp; Designing Jrid Phase of Ngamocyeik WTP (Nyaunghnapin) for surplus 45 MGD water from Ngamocyeik WTP (Nyaunghnapin) for surplus 45 MGD water from Ngamocyeik Reservoir</li> <li>Controlling turbidity of treated water less than 1 NTU</li> <li>Sustainable Improvement of Central Lab and Mini Laboratories Implementing Effective Chlorine Basic Plan (because of insufficient knowledge in Chlorine Basic Plan Formulation)</li> </ul>	<ul> <li>Need the support of TA Experts in Designing the water treatment facilities for the improvement of water quality management</li> <li>Need to construct new disinfection facilities and Lagunbyin water supply project according to the schedule to develop proper documents for O&amp;M of these facilities in this TA project</li> </ul>

EDWS had made requests of the additional supports from JICA as below.

(1) Designing of 3rd phase of Nyaunghnapin WTP

(2) Implementing direct filtration demonstration treatment plant(3) Implementing water reservoirs conservation

JICA headquarters replied that is difficult to include these additional activities in the Project activities since many additional activities have been included in the Project activities and the

in

Project has the budget limitation. However, the assistance for transmission system	countermeasures against physical loss and commercial loss should be completed at
improvement required for the 3 <sup>rd</sup> Phase Nvaunehnanin WTP and water reservoirs	the end of October. 2019.
conservation can be discussed to be included in the activities of the expert from Fukuoka City.	<ul> <li>All sectors should participate in NRW reduction roadmaps actively.</li> </ul>
One C/P in charge commented that all three requests have come up from the achievements of	(3) Water quality management (Output-3)
the Project, and intended to expand them. JICA expert team also showed a willingness to	O&M system of Lagunbyin WTP should be established before operation.
continue to support for these requests as far as they can.	O&M system of Chlorine facilities needs to be prepared before operation.
The Chief Advisor of JICA experts showed his view on the prospects that the progress was	Then, further recommendations were presented for further growth toward the achievement of
very good and the Project would be successful at the end. He commented that many activities	EDWS vision.
are remained for output 2 (NRW management) due to delay of equipment procurement and all	• The data should be accurate in formulating PIs and KPIs to evaluation water work
counterparts of NRW section need to tackle for these activities so that it would be successfully	management by PCDA management, and collected regularly.
completed. He also recommended that PDCA cycle that is now under implementation in the	The executive officials need to support and participate actively, and to be sure for
Project will be utilized for managing other plans prepared including mid-term management	calculation of unit price of water production, profit and loss, and annual financial
plan, HRD plan, NRW management plan and water quality management plan.	report.
	• The existing HRD section should be reinforced by assigning the surplus staffs for
3. Conclusions and recommendations	development of workability more since there are a lot of implementation works.
Deputy Head of Department showed his general impression of capacity development as the	Customer Call Center is expected to conduct good communications between EDWS
fruits of the Project that following capacity of staff has been improved very much.	and the customers.
<ul> <li>Development of Human Resources and Capacity Buildings</li> </ul>	The public campaign and Mobile Public Awareness Programs should also be
> Communication Skill	formulated.
Presentation Skill	<ul> <li>RGSMs for Customer Services such as application acceptances, meter readings,</li> </ul>
<ul> <li>Technical Skill.</li> </ul>	income management should be formulated as fast as we can.
P General Knowledge	<ul> <li>All sectors should participate in NRW reduction roadmaps actively.</li> </ul>
<ul> <li>Formulating of RSGMs and SOPs</li> </ul>	• TA Experts' support is necessary in designing the water treatment facilities for the
<ul> <li>Formulating NRW Reduction Project in Yankin and Training Yard</li> </ul>	improvement of water quality management.
Establishment of Mini Laboratories	
<ul> <li>Function test and improvement plan in Nyaunghnapin WTP and Gyobyu WT</li> </ul>	(End)
Following conclusions and recommendations for the Project activities were presented.	
(1) Institutional management (Output-1)	
· Cooperation and participation of all levels of EDWS's official are needed to draft	
RSGMs for water supply services.	
<ul> <li>A new organization structure, in which the proposal by the Project is considered,</li> </ul>	
should be set up and approved by Mayor.	
· Full time staff members in Planning Section are necessary to give a direction of	
PDCA cycle to EDWS staff. They should be selected in March, 2019.	
2) NRW management (Output-2)	

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- > Communication Skill
- Presentation Skill
- Technical Skill
- Formulating of RSGMs and > General Knowledge
- Formulating NRW Reduction
  - Establishment of Mini Labor
- Function test and improveme

- Cooperation and participation RSGMs for water suppl
- A new organization str
  - · Full time staff member should be set up and app
- PDCA cycle to EDWS :

(2) NRW management (Output-

· Pipeline network installation in pilot project (Phase I) should be finished at the beginning of July, 2019 based on the NRW schedule. The evaluation of cost-benefit

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MINUTE	ES OF MEETING	
OF THE EIGHTH JOINT	COORDINATING COMMITTEE	Attachment 1: Main points discussed and decided
	FOR	
"The Project for Improvement o	of Water Supply Management of YCDC"	1) Review of previous recommendations and progress
		The conclusions and recommendations of previous seven JCCs and their progress were
Based on the Record of Discussions (R/D Management of YCDC (hereinafter referred	<ul> <li>on the Project for Improvement of Water Supply d to as "the Project") signed on 25th November 2014</li> </ul>	reviewed. The progress of the Project was explained and recognized by all participants.
between Yangon City Development Commi	ittee (hereinafter referred as "YCDC") and the Japan	The Chief Advisor of JICA experts showed his view on the prospects that the progress was very
International Cooperation Agency (hereinal	fter referred to as "JICA"), and amended on Sth May	good, and the Project would be successful at the end. However, he commented that many
2017 and 19th September 2018, JICA hi	as dispatched the Expert Team to Myanmar for	activities in the output 2 (Non-revenue water (NRW) management) behind schedule due to
implementation of the Project since 4th July	y 2015.	delay of equipment procurement, and all counterparts of NRW section need to tackle for these activities so that it would be successfully completed. He also recommended that PDCA cycle
The 8th meeting of the Joint Coordinating C	Committee (hereinafter referred to as "JCC") for the	that is now under implementation in the Project will be utilized for managing other plans
Project chaired by the Secretary of YCDC v	was held on 24 <sup>th</sup> October 2019.	prepared including mid-term management plan, HRD plan, NRW management plan and water
The following agenda was presented and di-	iscussed amono the narticinants of the ICC meeting	quality management plan.
including the counterparts of Engineering	g Department (Water and Sanitation) (hereinafter	2) Sustainable human resource management
referred to as "EDWS") of YCDC, JICA M	Ivanmar Office and JICA Expert Team.	A drafted human resource development (HRD) nian was explained by the counternarts in which
1. Review of previous recommendat	this and progress	long-term HRD activities are proposed for achievement of EDWS's mission. The most critical
2. Sustainable human resource mana	agement	issue "how to retain young capable staff" was discussed among participants so that participants
3. Overall progress of project, and is	ssues to be shared and undate of prosnect of project	deenened the understanding and mesented countermeasures about the issue. In consideration of
success and discussion		the measures, it is necessary to differentiate between permanent staff and non-permanent staff.
4. Recommendations and conclusion	SU	
		The Secretary made comments on the HRD Plan: 1) The Plan should incorporate PPP practice
In the course of discussions, main points dis	scussed and decided are summarized in Attachment	in it which YCDC is now proceeding, 2) the employment of permanent staff should be
1		considered to be more competitive, such as introduction of examination, and 3) it is necessary
	Mangon, 29 November 2019	for each staff to be responsible for self-learning to increase efficiency of the organization.
		3) Conclusions and recommendations
1+ 20 21 40		3.1. Recommendation by JICA Consultation Team
P/21. 420 24 (		Through site observations and a series of interviews, the Team confirmed that the progress of
Mr. Hirotaka Sato	U Myint Zaw Tan	the most of activities were going on schedule as planned. However, some remaining risks were
Chief Advisor	Head of Department, Department of	pointed out by the team and made recommendations as follows;
The Project for Improvement of Water	Engineering (Water and Sanitation), Yangon	1) Human Resources Management
Supply Management of YCDC	City Development Committee (YCDC),	Acquiring younger and capable staffs and retaining the expertise staffs are critical issues for not
	The Republic of the Union of Myanmar	only to sustain the effort of the Project, but also to create future waterworks management.
		Continuous actions are important to approach to share this issue and to discuss about the
		solution with YCDC top management level and Yangon Regional Government and relevant
		organization. In addition, YCDC should consider the way to keep younger staffs' motivation.

2) O&M of Water Treatment Facilities

Due to delay of start of operation of Lagunbyin WTP and chlorination facilities, it is making harder to conduct the activities related O&M of WTP and chlorination facilities as stated as the activities under Output 3. The team requested the Project team to clarify the schedule of the start of operation and to reconsider how much related activities can conduct within the remaining project period.

3) Continuous Monitoring and Proper Instruction in the field level

Customer service manuals, currently under drafting, should be utilized and updated continuously based on the feedback from the activities in the field level. EDWS should monitor whether the work in the field is in accordance with the manuals. The same measures should be applied to standard operation procedures (SOPs) under preparation for entire EDWS work procedure.

4) Utilized Proper Materials with the viewpoint of Life Cycle Cost

It is important to procure and utilize the proper existing materials and equipment as well as appropriate installation and construction method of the facilities. Investment to utilize the highquality materials and equipment will increase the initial cost of EDWS, but it is high possibility to reduce the total cost of O&M of EDWS with the viewpoint of Life Cycle Cost.

# 3.2. Recommendation and Conclusion by Chief Engineer

Responding to the recommendations from JICA Team, some comments and recommendations for the Project activities were presented.

- 1) Human Resources Management
- C/P members for Planning Section and NRW activities have been assigned.
- For knowledge sharing, we will select the suitable person to dispatch to foreign training. After training, the knowledge and experiences should be shared and analyze for application.
  - 7 To retain younger staff, team leader should be responsible for taking care of them more. Thus, it is necessary to review the team leader's capabilities.
    - Each staff should be aware to be more competitive by self-learning.
- To motivate younger staff, new positions of young engineers have been presented in a proposal of the new organization.
- 2) O&M of Water Treatment Facilities
- For chlorination facilities, task force team has been launched.
- 3) Continuous Monitoring and Proper Instruction in the field level
- Task force team is responsible to monitor SOP preparation and application in each office.
- After developing SOPs, we should continuously review, discuss and revise them as needed.
- Utilized Proper Materials with the viewpoint of Life Cycle Cost

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EDWS is now shifting to consider adapting materials of enough quality.
 We need to set up technical standard as specification for procurement.

### MINUTES OF MEETING ON THE NINTH JOINT COORDINATING COMMITTEE FOR

"THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY MANAGEMENT OF YANGON CITY DEVELOPMENT COMMITTEE (YCDC)" The Terminal Evaluation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Dr. MATSUMOTO Shigeyuki visited Yangon from January 21<sup>st</sup> to January30<sup>th</sup>, 2020 for the purpose of conducting the terminal evaluation on the technical cooperation project, namely "the Project for Improvement of Water Supply Management of Yangon City Development Committee (YCDC)" (hereinafter referred to as "the Project"). As a results of the intensive study and analysis of the activities and achievement of the project, the Team prepared the Terminal Evaluation Report (hereinafter referred to as "the Report") attached hereto and presented it to the  $9^{th}$  Joint Coordinating Committee (hereinafter referred to as "the JCC") held on January  $30^{th}$ , 2020.

After discussions in respect of recommendations and issues for the successful implementation of the Project, the  $9^{th}$  JCC approved the contents of the Report and the respective representative of the Myanmar side and the Japanese side agreed to the matters referred to in the documents attached hereto.

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Dr. MATSUMOTO Shigeyuki Leader The Terminal Evaluation Team Japan International Cooperation Agency Japan

angon, January 30th, 2020

Daw Hlaing Maw Oo Secretary Yangon City Development Committee (YCDC) Republic of the Union of Myanmar

## THE ATTACHED DOCUMENT

1. Terminal Evaluation of the Project

The Team presented the results of the terminal evaluation at the  $9^{th}$  JCC, and the JCC approved the Report as attached.

(End)

Attachment: Terminal Evaluation Report

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ANNEX	ES

Annex 1. Project Design Matrix (the 3rd version revised in August 2018)

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Annex 3. List of counterparts

Annex 4. Counterpart Training in Japan and the third-country Annex 5. Equipment provided by Japanese Side

Annex 6. Local cost borne by Myanmar side

Annex 7. Local cost borne by Japanese side

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Terminal Evaluation Report

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The Project for Improvement of Water Supply Management of YCDC

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Republic of the Union of Myanmar

30th January, 2020 The Terminal Evaluation Team (N)

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ABBREVIATIONS

Abbreviation	English
ACE	Assistant Chief Engineer
CE	Chief Engineer
C/P	Counterpart
DMA	District Metered Area
DYCE	Deputy Chief Engineer
EDWS	Engineering Department (Water and Sanitation)
EE	Executive Engineer
HRD	Human Resource Development
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
KPI	Key Performance Indicator
MCDC	Mandalay City Development Committee
MGD	Million Gallons per Day
MKPI	Major Key Performance Indicator
NRW	Non-Revenue Water
O&M	Operation and Maintenance
OJT	On-the-Job Training
PDCA	Plan-Do-Check-Action Cycle
PDM	Project Design matrix
PO	Plan of Operation
ppp	Public Private Partnership
PPWSA	Phnom Penh Water Supply Authority
PI	Performance Indicator
PO	Plant of Operation
S/C	Steering Committee
SOP	Standard Operating Procedure
T/S	Township
WTP	Water Treatment Plant
YCDC	Yangon City Development Committee

## 1. Outline of the Evaluation

### 1-1. Background

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Greater Yangon is the economic center of Myanmar with the population of approximately 5.21 million (the National Census 2014). The water supply system in Yangon was established in the year of 1842 and currently provides water from 4 reservoirs and a number of wells. The water supply service ratio was 37% in 2011. On the other hand, the rapid economic development of Yangon city had made urgent issues such as the gradual development of waterworks facility to meet the rapid increase of water demand. Moreover, approximately 90 % of distributed water came from reservoirs, and two thirds of this was distributed directly without any treatment before the Project started. In addition, non-revenue water (NRW) ratio in Yangon City was estimated 66% in 2013, and revenue of water tariff was insufficient because of lower rate of water tariff (e.g. Before the Project, the metered rate was about 88 Kyat/m3, flat rate: about 1,800 to 3,000 Kyat/month). Under the above circumstances, JICA assisted YCDC to prepare Water Vision and of Water Supply System Master Plan (M/P) with the target year of 2040 through "The Preparatory Survey on the Project for the Improvement of Water Supply, Sewerage and Drainage System in Yangon City". Based on the M/P, Japanese ODA Loan Projects "Greater Yangon Water Supply System Improvement" (Phase1 and Phase2) are now being implemented. JICA also dispatched three long-term experts, "Advisor on Water Supply Management in Yangon City", "Advisor on Water Supply and Sanitation Improvement in Yangon City" and "Advisor for Water Service Administration and Water Supply in Yangon City" since 2012. In addition to these advisors Technical Cooperation Project "The Project for Improvement of Water Supply Management of Yangon City Development Committee (YCDC)" is being implemented since 2015 to enhance the capacity of YCDC for water supply services focusing on institutional management of vater supply utility, NRW management and water quality management.

Before the project completion in July 2020, as per the third amended R/D signed on September 19, 2018, the Terminal evaluation Team (hereinafter referred to as "the Team") conducted the terminal evaluation of the Project from January 13 to January 30, 2020.

### 1-2. Objectives

- Review the activities of the project and its process of implementation based on the Record of Discussions (R/D).
- (2) Analyze and discuss the achievement of the project in terms of five evaluation criteria (relevance, effectiveness, efficiency, impact and sustainability).
- (3) Based on the evaluation results above, identify recommendations and lessons learned for solving issues related to the Project
- (4) Discuss the activities of the Project for the rest of the cooperation period.
- (5) If necessary, propose revisions to the Project Design Matrix (PDM) and Plan of Operation (PO) based on the results of discussions.

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00000.       Criteria         1-3.       Outline of the Project         The Project is currently implemented based on the PDM Version 3, which was revised and approved in       Relevance         August 2018. The PDM is shown in Annex 1.       Efficience         Theorem 11 Project Duration:       Efficience         From July 2015 to July 2020 (5 years)       Efficience         From July 2015 to July 2020 (5 years)       Impact         From July 2015 to July 2020 (5 years)       Sustainat         From Solid to July 2020 (5 years)       Sustainat         Greater Yangon       Source: TC         Overall Geal:       Source: TC         Water supply services provided by YCDC are enhanced.       1-4-3.         Option:       Option:         Capacity of YCDC on the management of water supply service is improved.       Marce         Source: TC       Capacity of YCDC on the management of water supply utility is improved.	Criteria Relevance Effectiveness Efficiency Impact Impact Sustainability Sustainability Source: JICA Guide 1-4-3. Collection The specific methoc • Documents rel • Answers to the	Definitions           Degree of co         policy of the           Passure oi         Efficiency m           A measure oi         Efficiency m           Efficiency m         the inputs.           The positive         directly or in           effects result         other develop           Sustainability         are likely to c           are likely to c         silnes for Project B           Methods and Dat         is to collect data/m	ompatibility between the development assistance and priority of e target group, the recipient, and the donor. of the extent to attain its objectives. The extent to attain its objectives and quantitative – in relation to neasures the outputs – qualitative and quantitative in relation to neasures the outputs – qualitative and quantitative in the neasures the outputs – qualitative and quantitative in the neasures the outputs – qualitative and quantitative in the measures the outputs – qualitative and quantitative in the neasures the outputs – qualitative and quantitative in the information the activity on the social, economic, environmental and prenent indicators. The provide the benefits of an activity continue after donor funding has been withdrawn. Svaluations, May 2014 ta Sources in formation and their sources are described below.
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<ul> <li>3) Overall Goal:</li> <li>3) Overall Goal:</li> <li>Water supply services provided by YCDC are enhanced,</li> <li>4) Project Purpose:</li> <li>4) Project Purpose:</li> <li>5) Ourputs:</li> <li>5) Ourputs:</li> <li>14-3. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li>14-4. Col</li> <li< td=""><td>Source: JICA Guide Source: JICA Guide 1-4-3. Collection The specific methoc • Documents rel • Answers to the • Interviews with</td><td>are likely to of slines for Project Ev Methods and Dat is to collect data/m ated to the Project i</td><td>continue after donor funding has been withdrawn. Evaluations, May 2014 Ata Sources Information and their sources are described below.</td></li<></ul>	Source: JICA Guide Source: JICA Guide 1-4-3. Collection The specific methoc • Documents rel • Answers to the • Interviews with	are likely to of slines for Project Ev Methods and Dat is to collect data/m ated to the Project i	continue after donor funding has been withdrawn. Evaluations, May 2014 Ata Sources Information and their sources are described below.
<ol> <li>3) Overall Goal:</li> <li>Source: JIC.</li> <li>Water supply services provided by YCDC are enhanced,</li> <li>14-3. Col</li> <li>14-3. Col</li> <li>The specific Tappose:</li> <li>Capacity of YCDC on the management of water supply service is improved.</li> <li>Docum</li> <li>Answe</li> <li>Outputs:</li> <li>Intervi</li> <li>Ited S</li> </ol>	Source: JICA Guide 1-4-3. Collection The specific method • Documents rel • Answers to the • Interviews with	dines for Project B Methods and Dat is to collect data/in ated to the Project	Evaluations, May 2014 <b>ata Sources</b> nformation and their sources are described below.
<ul> <li>water supply services provided by YUDC are enhanced,</li> <li>1-4-3. Col</li> <li>The specific</li> <li>The specific</li> <li>The specific</li> <li>Project Purpose:</li> <li>Capacity of YCDC on the management of water supply service is improved.</li> <li>Docum</li> <li>Answe</li> <li>Answe</li> <li>Outputs:</li> <li>Capacity of YCDC on institutional management of water supply utility is improved.</li> <li>Field S</li> </ul>	<ol> <li>1-4-3. Collection The specific method</li> <li>Documents rel</li> <li>Answers to the</li> <li>Interviews with</li> </ol>	Methods and Dat is to collect data/in ated to the Project	<b>ita Sources</b> nformation and their sources are described below.
<ul> <li>4) Project Purpose:</li> <li>4) Project Purpose:</li> <li>Capacity of YCDC on the management of water supply service is inproved.</li> <li>Evaluation for the management of water supply utility is improved.</li> <li>Field S</li> </ul>	The specific method Documents rel. Answers to the Interviews with	is to collect data/in ated to the Project	nformation and their sources are described below.
<ul> <li>Capacity of YCDC on the management of water supply service is improved.</li> <li>Answe</li> <li>Answe</li> <li>Outputs:</li> <li>I. Capacity of YCDC on institutional management of water supply utility is improved.</li> </ul>	<ul> <li>Documents rel</li> <li>Answers to the</li> <li>Interviews with</li> </ul>	ated to the Project	
<ul> <li>Answe</li> <li>5) Outputs:</li> <li>1. Capacity of YCDC on institutional management of water supply utility is improved.</li> <li>Field S</li> </ul>	<ul><li>Answers to the</li><li>Interviews with</li></ul>		t including record of Inputs and Activities of the Project
<ul> <li>Intervio</li> <li>2) Outputs:</li> <li>1. Capacity of YCDC on institutional management of water supply utility is improved.</li> <li>Field S</li> </ul>	<ul> <li>Interviews with</li> </ul>	questionnaire fille	ted in by JICA experts and Myanmar counterparts
1. Capacity of YCDC on institutional management of water supply utility is improved.		a the Project counter	iterpart personnel and experts
	<ul> <li>Field Survey</li> </ul>		
2. Capacity of YCDC on NRW management is improved.	Monthone	f the Torninal one	London Trom.
<ol> <li>Capacity of YCDC on water quality management is improved.</li> </ol>	The evaluation was con	nducted by the foll	Ilowing members.
1-4. Methodology	Title	Name	Organizations & Position
1-4-1. Method of Evaluation	Team Leader	MATSUMOTO	Deputy Director General, and Group Director for Water
The Terminal evaluation was conducted in accordance with the latest JICA Guidelines for Project		Shigeyuki	Resources, Global Environment Department, JICA
Evaluations issued in May 2014. Current project status and outcomes were assessed from the aspects of	Planning &	ARAMAKI	Water Resources Team 1, Water Resources Group, Global
the five criteria of relevance, effectiveness, effe	Coordination	Risa	Environment Department, JICA
The Team conducted surveys at the Project sites by interviews and questionnaires to the Project	Utility	KASE	Director for International Affairs, General Affairs Division,
counterpart personnel and the JICA experts involved in the Project.	Management	Daisuke	Bureau of Waterworks, Tokyo Metropolitan Government
Operation and	Operation and	TOKUDOMI	Chief of Management and Planning Section, General Affairs
1-4-2. Five Evaluation Criteria	Maintenance of	Yuki	Department, Fukuoka City Waterworks Bureau
Water Facility Description of the five evaluation criteria that were annihed in the analysis for the Terminal evaluation is	Water Facility		
orienting of the Abelian of the Abel	Utility	SATO	Planning and Coordination Section, General Affairs
Management	Management	Masahiro	Division, Bureau of Waterworks, Tokyo Metropolitan
(Assistant)	(Assistant)		Government
Evaluation	Evaluation	TOTSUKAWA	Director, International Department, Sano Planning Co., Ltd
Analysis	Analysis	Jun	

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1-6. Schedule of the Terminal evaluation

The Terminal evaluation was conducted during the period between the 12th of January 2020 and the 30th of January, 2020.

## 2. Achievements of the Project

### 2-1. Records of Inputs

The following are the achievements of inputs by the time of the Terminal evaluation by both Japanese side and Myanmar side.

### 2-1-1 Japanese Side

1) Assignment of Experts

Since the beginning of the Project, a total of thirteen (13) experts were dispatched on a short-term basis and one (1) long-term expert. Total man-months is 174.60 until the end of November 2019. The details are shown in Annex 2.

# 2) Training in Japan and the third-country training

Nine (9) persons in total participated in the training course in Japan and 37 in the third-country, Thailand and Cambodia. The details are shown in Annex 4.

### 3) Provision of Equipment

Equipment for field work including NRW management and water quality analysis, and office work such as computers were provided. The details are shown in Annex 5.

### 2-1-2 Myanmar Side

1) Assignment of Myanmar Counterparts

Myanmar side assigned a Project Director responsible for the overall administration and implementation of the Project and a Project Manager. Counterparts from respective technical fields counts to 119. The details are shown in Annex 3.

### 2) Cost borne by Myanmar side

Myammar side allocated the following budget, approximately 2.4 billion Kyat for the Project. \* Cost for project office (electricity, internet connection, telephone, security and cleaning) \* Cost for pilot project such as Nyaunghnapin water treatment plant improvement project, reservoir water treatment project in Hlwaga and Gyopu, and NRW management project \* Cost for development of application of customer management system \* Cost for laboratory works such as reagent

The details are shown in Annex 6.

# 2-2. Results of the Activities and Achievement of the Outputs

Achievement status of each Output is as follows:

Indicators	Activities and Achievement Level
1-1 Plan for improvement of	The indicator 1-1 was already fulfilled.
water bill collection is	The Project elaborated the plan for improvement of water bill collection
approved by EDWS.	and already gained approval of the plan from the director of EDWS. The
	plan aims at developing a new customer management system on water
	bill collection.
	The new system completed in 2019 with functions of "search and
	registration of customers", "meter reading", and "water billing". The
	Project is now under process to add more functions of "collection system
	of water tariff', "management of unpaid customers", and other statistical
	data treatments. The functionality and effectiveness of the first version
	system was already confirmed in the pilot township.
	During the remaining period the guideline on customer management
	composed of chapters "meter reading" and "water bill collection" will
	be completed.
1-2 Plan for human resources	The indicator 1-2 is likely to be fulfilled.
development is approved by	The Project has been working on development of an integrated plan that
EDWS.	includes not only human resources development as well as human
	resources management. The plan already presented at JCC in October
	2019. Several key issues including how to prevent job resignation of
	younger staffs and/or non-permanent staffs will be discussed. Approval
	of the final version is expected in February 2020 by S/C2.
1-3 Drafts of regulations,	The indicator 1-3 is likely to be fulfilled.
standards and guidelines for	Two guidelines regarding customer management and water bill setting
water supply services in	are under development and expectedly approved by EDWS within the
Yangon is approved by	Project period.
EDWS.	Standard Operating Procedures, SOPs, also have been elaborated until
	now at 33 divisions/sections of EDWS. As of January 2020, seven (7) of
	them are now being introduced after approvals, six (6) of them are
	waiting for trail after their approvals, twelve (12) of them completed
	their elaboration of final version, seven (7) of them are at completion
	stage of draft version, and one (1) of them is still in elaboration process.
	In addition, it is noted that the Project has delivered a lot of efforts in
	formulating Water Supply Regulation. The first draft was completed in

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in financial management, which is still in progress, understanding of tariff setting process, corporate accounting system and PPP alternatives, and analysis of customer complaint data in public relations section.

It is evaluated that YCDC' capacity has "improved" at all the targeted fields in the course of the Project implementation.

Indicators	Activities and Achievement Level
2-1 Manuals and training	The Project has been progressing towards fulfillment of the indicator's
materials on NRW	requirement.
management are utilized by	Based on observations and lessons learned through the pilot project since
YCDC staff.	January 2019, the Project is now making the SOPs of NRW as a
	technical manual and training materials. In addition, another training
	material specifically for The Training center for NRW management will
	be prepared soon as well. By March 2020 these SOPs and training
	materials will be finalized, and expectedly receive official approval by
	S/CI in April 2020.
	It is noted, however, the period of utilization of SOPs and training
	materials by YCDC staffs will be shorter than originally planned
	because of belated start of the pilot project which were caused by delay
	in procurement of NRW equipment.
2-2 Information of	The indicator 2-2 was already fulfilled.
customers and pipes for the	The Project started making the customer list in the pilot area, Yankin in
pilot areas is compiled and	January 2019 and finished in December of the same year. In parallel with
updated.	making the list, information update on the list has also been conducted
	according to the change and/or move of customers.
	Information of distribution pipeline has also been compiled in EDWS.
	The Project is now planning to transfer corresponding information onto
	GIS.
2-3 The number of trainers	The Project has been progressing towards fulfillment of the indicator's
for NRW management	requirement, but it is difficult to foresee if it can fulfill or not within the
becomes 8.	Project period.
	A series of trainings on NRW has continued by use of the pilot project,
	which widely covers the training topics such as pipe construction,
	detection of water leakage and rehabilitation of pipe. In addition, even
	before the pilot project commencement, the Project had conducted
	trainings how to calculate service coverage rate, the mechanism of NRW

"Authority" body. This newly developed organizational structure is collaborated work with a legal advisor of YCDC. The final draft version Based on the proposals presented in the "Report on Institutional Reorganization of Engineering Department (Water and Sanitation) of YCDC" in July 2016, the following divisions/sections were newly EDWS is now under final approval process transferring to an included in the proposal of Authority establishment, and already they started instructions and trainings to other divisions/sections and In addition, another three (3) younger staffs were assigned in Planning Section recently. They are also candidates to be internal trainers of development and management plan, 4) guideline, manuals and SOP, 5) planning and monitoring by November 2018, and now its status has reached the fourth draft with established with fulltime and part-time staffs, namely, Water Treatment Section, NRW Management Section, Transmission and Distribution Management Section, Planning Section, Human Resource Development submitted to Mayor. Once its finalization process completes, it can be Two (2) staffs in Planning Section have participated in the Project since in the context of PDCA cycle. Their technical capacity and knowledge For the goal of the Output1 aiming at YCDC's capacity development on institutional management, the the Project targeted are as follows: 1) customer service, 2) mid-term plan, 3) human resource Some technical fields, for example, financial management and public relations are not monitored by the direction of PDCA cycle to the beginning that included trainings how to analyze and utilize PI data township offices as internal trainers of EDWS on these planning issues Project successfully realized the goal at various institutional management aspects. The primary aspects PDCA concept and PI setting with analysis, 6) financial management, and 7) Public relations. In addition, indicators like others. They have also shown actual improvements such as formulation of asset inventory and to formulate mid-term management plan. After the training period, it should be highlighted that there was improvement in the institutional arrangement such as new are almost reaching reliable level to instruct PDCA cycle. The indicator 1-4 was virtually fulfilled already. The indicator 1-5 is almost fulfilled as of now. The Project has almost achieved the Output 1 as of the Terminal evaluation. Section, and Customer Service Division. PDCA cycle in the mid-run perspective. organizational structure of EDWS and setup of Steering Committees of the regulation will be ready soon. judged that the indicator is fulfilled. organization approved by 1-5 2 Full time staff members in Planning Section can give **Overall** assessment: structure is New EDWS staff. Mayor. 14

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	occurrence and others.	with the original schedule du	to the belated launch of the pilot project, w
	Although technical transfer has continued through such a series of	process of equipment procur	ement. It automatically entailed the delay i
	trainings in integrated manner to create internal trainers, the Project have	materials including SOPs as w	all. In addition, job resignation of counterparts
	faced frequent changes and/or leaves of counterparts until now, which	in developing internal trainers	during the Project period.
	resulted in less counterparts as internal trainer candidates than originally	It is noted, however, that the P	oject has recently accelerated the activities inc
	expected.	and training materials through	sorting out lessons from the pilot project. Tri
	The Project will continuously try increasing the number of candidates,	center for NRW management	at Yegu are also about to start implementing.
	though, it cannot be sure if the number reaches the target or not,	is prospected the achievement	status of the Output 2 will be higher through t
	considering the current situation, which judges six (6) to seven (7)		
	counterparts have gained enough technical capacity as internal trainers		
	as of now.	Output 3: Capacity of YCI	OC on water quality management is improv
2-4 EDWS staff participates	The Project has been progressing towards fulfillment of the indicator's	Indicators	Activities and achievement level
in training based on training	requirements, but the current status is still in the middle of its	3-1 Manuals and training	The indicator 3-1 was already fulfilled.
plan for NRW management.	expectation/requirements.	materials on water quality	<ul> <li>Water quality management</li> </ul>
	As noted in the indicator 2-3, the number of EDWS staffs participating	management are fully	The Project finished elaborating SOPs on w
	in the NRW management training is rather limited than originally	utilized by YCDC staff.	chlorination facilities as technical manuals a
	planned as of the Terminal evaluation. Trainings are initially offered to		on water quality management in February 20
	NRW section, and currently expanded through the pilot project in		utilized for operation of water treatment plan
	Yankin to the counterparts, thirteen (13) from NRW section, one (1)		
	from Yegu pump station, and two (2) from the pilot project, sixteen (16)		<ul> <li>Water quality monitoring</li> </ul>
	in total.		The Project also has been conducting water o
	Since the Training center for NRW management opened in January		SOPs on water quality analysis, whose first
	2020, training opportunities for EDWS staffs are expectedly increased		2016. The SOPs has been effectively utiliz
	with this facility.		laboratory but also at other on-site mini labo
2-5 NRW ratio is decreased	The indicator 2-5 is likely to be fulfilled.	3-2 Result of the water	The indicator 3-2 is being fulfilled as of the
to 25% in the pilot area.	NRW ratio of the pilot project area was calculated as 86% on the basis	quality test by the central	Following monthly water monitoring plan,
	of water flow test in February 2019. The Project is planning to renew the	Iaboratory and on-site mini	conducted water quality tests of the samples
	distribution pipes and meters at the area. Owing to these renewals, it is	laboratory is recorded and	points. As for reservoirs and water treatmen
	highly possible for NRW ratio to be lower than 25%. The figure is	monitored periodically.	are conducted every morning and afternoon.
	expectedly presented by March 2020.		since 2015 at the central laboratory and 2017
<b>Overall assessment:</b>			
The achievement status of the	Output 2 is moderate at the time of the Terminal evaluation, but its degree	3-3 The number of trainers	The indicator 3-3 was already fulfilled.
can be higher by the end of th	e Project.	for water quality	<ul> <li>Water quality management</li> </ul>
EDWS staffs have accumula	ted essential skills for NRW management such as how to detect water	management becomes 4.	Through a variety of trainings such as clas
leakage, to repair pipe and to	conduct water pressure tests in the context of physical loss. The aspect of		seminars, the Project has transferred technic
commercial loss such as how	to collect and manage data on water leakage, broken meters is also well		create internal trainers. According to evaluat
trained. These skills and know	cledge have been utilized in the pilot project area and other areas as well.		of trainings, two (2) staffs are now qualified
On the other hand, developm	nt of internal trainers on NRW management has been delayed comparing		

which was caused by longer in development of training also gave severe challenges

luding formulation of SOPs aming plans at the Training By the end of the Project, it these accelerated actions.

puto. Capacity of ICL	AC OIL WATER QUALITY MANAGEMENT IS JUNPI UVEU.
cators	Activities and achievement level
Manuals and training	The indicator 3-1 was already fulfilled.
erials on water quality	<ul> <li>Water quality management</li> </ul>
agement are fully	The Project finished elaborating SOPs on water treatment plant and or
zed by YCDC staff.	chlorination facilities as technical manuals as well as training material
	on water quality management in February 2019. The SOPs has been wel
	utilized for operation of water treatment plants.
	Water quality monitoring
	The Project also has been conducting water quality monitoring by use o
	SOPs on water quality analysis, whose first version was completed in
	2016. The SOPs has been effectively utilized not only at the centra
	laboratory but also at other on-site mini laboratories.
Result of the water	The indicator 3-2 is being fulfilled as of the Terminal evaluation.
ity test by the central	Following monthly water monitoring plan, the central laboratory ha
ratory and on-site mini	conducted water quality tests of the samples gained from the monitoring
ratory is recorded and	points. As for reservoirs and water treatment plants, water quality test
uitored periodically.	are conducted every morning and afternoon. The data has been recorded
	since 2015 at the central laboratory and 2017 at on-site mini laboratories
The number of trainers	The indicator 3-3 was already fulfilled.
water quality	Water quality management
agement becomes 4.	Through a variety of trainings such as classroom trainings, OJTs and
	seminars, the Project has transferred technical knowledge and skills to
	create internal trainers. According to evaluation results made at the time
	of trainings, two (2) staffs are now qualified as internal trainers.

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	three (3) starts are considered as internal trainers, judging from the fact	<b>Overall assessment:</b>			
-	hat they already conducted younger staffs trainings as trainers and are	The Project has almost achiev	ved the Out	out 3 as of the Terminal evaluation.	
	riving technical instructions to on-site mini laboratories staffs in their	The capacity of YCDC staff	f on water q	uality management and monitoring	have been well upgraded
¢.	iaily works.	through a series of the Proj	ject activiti	ss. All the staffs of the central lab	oratory and on-site mini
-4 EDWS staff participates	The indicator 3-4 was already fulfilled.	laboratories fully participated	d in the train	ings and formulation/review of SOF	s. The number of internal
1 training based on training	All the EDWS staffs working at laboratories have already participated	trainers on water quality mana	lagement ha	s reached the target.	
lan for water quality i	n the trainings on water quality management. The participants are 10	Pilot actions to modify desi	tign includi	ig sand filter and proper operation	at Nyaunghnapin water
lanagement.	rom the central laboratory and 10 from on-site mini laboratories. The	treatment plant also steadily p	progressed, v	vhich enhanced technical knowledge	and skills of YCDC staffs.
-	roject conducted trainings on the basis of the timing when the SOPs	On the other hand, it is difficu	ult to confirm	a stable operation and maintenance s	/stem of Lagunbyin water
	laborated and revised, not based on the fixed training schedule and/or	treatment plant and chlorinati	ion facilities	since both of their operation have n	ot started yet.
	lan.				
-5 The turbidity of treated	The indicator 3-5 is being fulfilled as of the Terminal evaluation.	2-3. Achievement of Proj	ject Purpos		
ater in pilot sand filter in 1	he turbidity of treated water in Nyaunghnapin water treatment plant	Project Purpose: Capacity o	of YCDC o	1 the management of water supply	service is improved.
fyaunghnapin water I	as been well controlled less than 1 NTU nearly all the time. The	Indicators	Activitie	s and Achievement Level	
eatment plant is controlled t	urbidity surpassed 1 NTU at only three (3) times in 11 months at Phase	1. Steering Committees	The indic	ator 1 was already fulfilled.	
ss than 1 NTU.	facility and one (1) time in 16 months at Phase 2 facility until the	(S/C) are organized and	The direc	tor of EDWS approved establishmer	t of Steering Committee,
1	erminal evaluation.	improvement actions are	S/C, with	appointment of members for each S	C in July 2017. The
-6 The operation and 7	he Project has been progressing towards fulfillment of the indicator's	implemented.	organize	I S/C and the number of meetings ar	: as follows:
laintenance system of r	equirements, but the current status is still in the middle of its				
agunbyin water treatment r	equirements.		S/C	Primary field(s) of S/C	Number of S/C meetings
lant is prepared.	Administrative order was already issued to set up Task Force Team and				as of January 2020
	o allocate 19 staffs for trial operation of Lagunbyin water treatment		S/C 1	NRW management	5
-14	lant. In addition, organizational structure for the plant operation and		S/C 2	Planning and monitoring	6
E	naintenance and the terms of reference at each section were also		S/C3	Regulations, standards and guidelines	17
	etermined. After the trials, operation of the part of the plant is expected				
44	tom March 2020.		In June 2	018. S/C 3 additionally formed two	2) sub-proups, one of
1	he picture of operation and maintenance of the plant has been well		which tal	es care of installation of water sum	v equipment and another
<u>a</u>	esigned like this, though, it is difficult to be sure at this moment if the		is in char	ge of water billing and collection.	and the second s
60	ystem will function or not without any technical challenges.	7. Mid term management	The indiv	ator 2 was already fulfilled	
-7 The operation and 1	he Project has been progressing towards fulfillment of the indicator's	rist is survived by FDWS	The Mid	term management also shows the or	rrent eitustion/challengee
aintenance system of r	equirements, but the current status is still in the middle of its		and their	action nlans with corresponding tare	ets for their
ilorination facilities is r	equirements.		improver	nents in the mid-term perspective T	e nlan covers the issnes
repared.	rganizational structure of the chlorination facilities was already		such as v	ater supply services water resource	development. NRW
Ģ	etermined, which separates into two (2) teams with four (4) engineers		manaoem	ent water mality water hilling coll	ction financial
đ	nd five (5) operators under a facility manager. The trial operation of the		managen	tent, administration and human resou	rces
Ŧ	acilities is expected after January 2020.		developn	tent/management.	
1	n the same context of 3-6, it is difficult to be sure if the system will		The plan	was approved at the S/C 2meeting in	October 2018 and

ent situation/challenges equipment and another plan covers the issues evelopment, NRW ion, financial s for their ses

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	received an official letter in February 2019 from the director of EDWS.
. The implementation of	The indicator 3 is being fulfilled as of the Terminal evaluation.
iid-term management plan	The Project selected 15 types of primary indicators such as service
monitored based on	coverage rate, NKW rano and total number of connections as "Major
AKPIs.	Key Performance Indicators" as MKPIs from Key Performance
	Indicators, KPI. All the data have been collected since 2016 through
÷	the data monitoring system that the Project elaborated. All the
	monitored figures of MKPIs for the year of 2018/19 will be presented
	within January 2020.
. The NRW ratio is grasped	The indicator 4 is likely to be fulfilled.
1 the water supply service	The NRW ratio is about 50%, calculated on the basis of operation
rea of YCDC and	hours of pumping stations.
ionitored.	The Project also introduced the water flow monitoring system in
	September 2019. The ratio of October 2019 by use of the system is
	63%. The NRW section will continue to monitor the rate from now.
	*The rate will turn out only after three months due to necessary period to
	gather water billing.
Plan for NRW reduction	The indicator 5 was already fulfilled.
approved by EDWS.	Mid-term plan for NRW reduction which has three major categories:
	NRW management, physical loss, and commercial loss was approved
	in October 2018 at JCC. NRW reduction is placed as the highest
	priority issue in the Mid-term management plan.
Water quality is grasped	The indicator 6 is being fulfilled as of the Terminal evaluation.
the water supply service	The water quality monitoring plan exactly specifies the monitoring
ea of YCDC and	points, frequency, monitoring items, and methods in the water supply
onitored.	service area of YCDC. Each township sends samples to the central
	laboratory every month, and the monitoring results are presented to the
	director of EDWS in monthly basis.
	Since the technical capacity of the laboratories has reached almost
	technically reliable level, it can be judged that water quality is being
	grasped much more accurately than before.
Plan for improvement of	The indicator 7 is likely to be fulfilled.
ater quality is approved by	The Project has already elaborated "Report for Improvement Plan on
DWS.	Management of Water Treatment and Water Quality Based on the
	Third Country Research Study in PPWSA, Cambodia" through lessons
	and observation from the third-country training in Cambodia. On the
	basis of the report, the Project is now preparing the plan for
	improvement of water quality. It is expected to be completed by April

2020 and approved at JCC in May 2020.	
Overall assessment:	
The Project purpose has been almost achieved as of the Terminal evaluation.	
Towards the Project purpose "capacity development of YCDC on the management of water suppl	ply
service", the Project took approaches from three (3) aspects, 1) organizational and institutional aspec	sct,
2) operational aspect, and 3) technical aspect. As the achievement status of the Outputs show, there wer	ere
re-development of organizational structure, formulation of guidelines/SOPs and others. In 2) operations	nal
aspect, planning and monitoring based on the mid-term plan with analysis of Pls are now well conducte	ted
by YCDC staffs. Technical aspect also showed significant improvement in water quality management	nt,
NRW management and others as mentioned in achievement status of Outputs.	

Although the Project still has remaining tasks such as increase in internal trainers, dealing with facilities that are about to start operation in full scale such as chlorination facilities, it can be evaluated that the Project activities successfully led to capacity development of YCDC in general. The achievement status of the Project purpose can be higher by the end of the Project.

# 2-4. Achievement prospect of Overall goal

Indicators	Prospects
1. The management key	The target figures have not been determined yet, but the following
performance indicators	situation and/or prospects can be pointed out.
(MKPIs) are improved	Yangon city can expect both YCDC's projects and donors' projects
compared to the data at the	including Japan to improve water supply services. It is highly possible
Project commencement.	for the figures of MKPIs to improve from now on.
2. NRW is decreased from	The target figures have not been determined yet, but the following
00 % to 00 % in the water	situation and/or prospects can be pointed out.
supply area of YCDC.	Replacement and/or new installation of flow monitoring system have
	already been progressing in the central area of Yangon city and will
	extend to entire city in coming years.
	Improvement efforts in customer management system including the
	modified process of meter reading and water billing are also expectedly
	contributing to lower NRW ratio. In addition, all other assets such as
	systematic training at the Training center for NRW management,
	SOPs, training materials and NRW management plan would
	expectedly contribute to fulfilling this indicator's requirements.
3. The compliance ratio in	The target figures have not been determined yet, but the following
terms of turbidity to meet	situation and/or prospects can be pointed out.
the water quality standard is	Improvement of Nyaunghnapin water treatment plant and the
increased from 00% to	commencement of operation at Lagunbyin water treatment plant will

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00%. The compliance ratio	contribute to improvement of turbidity. Residual chlorine is also	3. Evaluation by Five Criteria
is increased from OO% to	expectedly lower owing to operation of new chlorination facilities at	Each criterion is evaluated using the following five rankings: "high", "relatively high", "moderate".
00% in terms of residual	five (5) locations.	"relatively low", and "low".
chlorine (>0.2 mg/l).	In addition, all other assets such as SOPs, water quality management	
	plan and internal trainers would expectedly contribute to fulfilling this	3-1. Relevance
	indicator's requirements.	Relevance of the Project is high.
	However, it is noted that the effect of chlorination facilities can be	The Project is consistent with the priority of development policies of Myanmar and Yangon city, the needs
	influenced if distribution pipelines are not cleaned enough or replaced	of YCDC, and the assistance of policy of lapan. The relevance is evaluated high.
	because chlorine may be disappeared while flowing in dirty pipeline.	
Achievement prospect:		3-1-1 Consistency with the policy and/or plan of Myanmar
Achievement of the Overal	Il goal "improvement of water supply services by YCDC" is highly	The national five-year development plan as of the Project commencement had three pillars, 1) renovation
prospected, considering the 1	VCDC's proactive development efforts with corresponding budget and the	in policy, economy, administration, private sector development, 2) development by initiatives of Myanmar
plans of donor projects. Alti	hough there are no exact target figures in indicators at this moment, the	nationals, and 3) prioritized ten (10) development fields. Water supply services is placed as one of the 10
MKPIs' figures including NF	XW ratio are likely to proceed in the direction of improvement.	prioritized development fields.
*The indicators will be determin	ted soon after the necessary data is collected at least by the end of the Project.	The Myanmar Sustainable Development Plan 2018-2030 as of the Terminal evaluation has five (5) goals,
		one of which is "access to safe water" as Strategy 5.3.
2-5. Implementation Pro	cess of the Project	It is confirmed that the Project has been consistent with the national policy since the beginning of the Project
2-5-1 Communication		until now.
Communication among the Pi	roject experts and counterparts has been satisfactory. The Project set	As to the sector policy viewpoint, YCDC has been working on the basis of the "Yangon city water supply
communication platform such a	s weekly/half-monthly meeting and monthly meeting where all the Project	master plan". The Project is regarded as one of the important inputs to realize the master plan.
related persons shared the Project	st progress, challenges, and what knowledge and information they obtained.	Overall, the Project is in line with the national policy as well as the sectoral plan of Yangon city.
As the Project proceeded, mani-	agement of each meeting gradually transferred to counterparts' side from	
experts. As of the Terminal	evaluation, the meeting has been held in Myanmar language through	3-1-2 Consistency with Japanese assistance policy/plan
counterparts' chair. This transf	fer has brough positive effects for the counterparts to raise their ownership	The "Economic corporation direction to Myanmar" of Japan presented in April 2012 shows one of the
mind as well.		assistance goals, which is to support infrastructure development. Assistance in water supply services in
Record of the meeting has been	t well shared among all including experts who were not in Myanmar. The	Yangon city is placed as one of representative projects towards achievement of this goal.
long-term expert stationed in Ya	ngon also contributed to bridging communication between the counterparts	The Project is consistent with the policy direction of Japanese government.
and the experts while they were	not in Myanmar.	
		3-1-3 Consistency with the needs
2-5-2 Monitoring		Refore the Project started, the ratio of NRW in Yangon city had reached 66% due to improper NRW
Monitoring of the Project activit	ties including the pilot project has been well conducted by counterparts and	management (2013). Yangon city also faced challenges in water quality, proper operation and maintenance
experts together. Monitored infe	ormation has been shared through half-monthly meetings, SC meetings and	of various water supply facilities and equipment. Under such challenging situation, YCDC had strongly
JCC. Motoring results have bee	m also well recorded and analyzed by monthly report and annual progress	recognized the necessity to develop staffs' capacity in wide range from institutional to technical aspects
report.		including topics such as NRW and water quality management.
Monitoring by the Project has p	aid attention not only on the progresses of targeted technical fields but also	The Project has been providing technical assistance activities on various fields in accordance with such
on the progresses in accordance	with PDM targets from the project management viewpoint. Well balanced	necessity of YCDC. The contents and targets of the activities have been determined through mutual
monitoring on both sides is high	Ily evaluated.	consultation with YCDC counterparts and experts at the beginning of the Project.
		The Project has been meeting with the needs of Yangon city and YCDC in this context.

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## Effectiveness of the Project is high.

Capacity development of YCDC for water supply services has been steadily progressing at targeted technical fields. The effectiveness is evaluated high.

## 3-2-1 Progress of Project purpose

The Project purpose "capacity development of YCDC on management of water supply service" has been almost achieved as of the Terminal evaluation.

The Project took approaches from three (3) aspects for capacity development, which are 1) organizational and institutional aspect, 2) operational aspect, and 3) technical aspect. As the achievement status of the Outputs show, positive outcomes are observed at each aspect.

Essential knowledge and skills for water supply services, which had not been identified despite their importance, and/or had not been trained in spite of their requests before the Project, have been successfully accumulated step by step in YCDC staffs. In terms of "improvement" and "development" of capacity, the Project has been satisfactorily progressing towards full achievement of the purpose. The degree of its achievement can be higher by the end of the Project.

## 3-2-2 Contribution factors

The Project has been progressing owing to these contribution factors.

## 1) Effect of the third-country training

The Project provided the third-country trainings to Thailand and Cambodia in addition to Japan. Since both countries have development history on improvement of water supply service for relatively recently, the trainings not only gave counterparts technical knowledge but also raised their mind-set for improvement and motivation from learning their development experiences.

Looking at the tangible outputs on technical aspects, learnings from PPWSA of Cambodia were especially effective. The counterparts utilized their learnings especially on performance monitoring by PIs data, preparation of SOPs and development of various plans. The major plans they made are as follows:

- Management Improvement Plan of EDWS
- Improvement Plan for NRW Management and Customer Service
- Improvement Plan for Management of Water Treatment and Water Quality

# Application of knowledge and skills of local governments in Japan

The Project effectively introduced knowledge and skills that have been accumulated in local governments in Japan owing to participation of experts from local government group/line companies. Their knowledge and skills contributed to enriching the Project activities particularly in water quality management, customer services, methodology and/or process to set water tariff, NRW management and others.

In addition, advisory committees comprised Tokyo metropolitian and Fukuoka city also assisted in the Project activities during the Project period. Their advises and information also enhanced the effectiveness 16 R.

### of the Project activities.

# Process of designing the Project contents

The detailed planning survey of the Project in 2014 determined the basic fields to deal with in a project, but intentionally did not determine detailed activities contents as well as PDM indicators. The detailed planning survey encouraged counterparts and experts to consider and determine the activities through discussion, workshops such as problem analysis and/or capacity assessment after the Project started. Such relatively open-styled planning enabled to avoid mismatch of the technical needs and the Project started. Such the initial process of workshops and capacity assessment contributed to deepening mutual understanding as well as reteating ownership mind in counterparts.

# 4) Prompt decision making and actions by top management

The top management strata of YCDC, Yangon city, and the regional government has high recognition of the importance of the Project activities. Their recognition and leadership gave support to the Project in terms of personnel assignment and necessary budget securement. They also led to commencement of their own projects and/or equipment procurement in addition to the Project's support.

# 5) Synergetic effects of YCDC's spontaneous and prompt actions with the Project

In the course of the Project implementation, YCDC initiated many projects with their own budget as abovementioned such as NRW management pilot project in North Okkalapa, introduction of the customer management system, and the small-scale direct pilot filter project of untreated water from Hlwaga and Gyopyu reservoirs. These YCDC's activities produced symergetic effects with the Project activities. For example, prior to the start of the pilot project in Yankin, the Project could utilize the North Okkalapa pilot project as the venue for their training.

From the viewpoint of organizational aspect, YCDC promptly introduced new organizational structure proposed by the Project. Such quick adaptation made the Project focus on the Project activities contents more clearly with more specified counterparts.

Overall, it is highly evaluated that YCDC's spontaneous and prompt actions brought synergy effects with the Project and enhance the effectiveness of the Project.

# 6) Assignment of a long-term expert stationed in Myanmar

The Project dispatched a long-term expert in Myanmar in addition to the expert team. Besides the original technical task, the long-term expert enhanced bridging information and relationship between the counterparts and the expert team, and contributed to improving management and follow-up of the Project activities.

## 3-2-3 Inhibition factors

The Project has faced these inhibition factors against achievement of the Outputs and the Project purpose.

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The Project has sometimes faced challenges of change and/or decrease in counterparts due to their job resignation, which has hampered consecutive technical transfer. The challenge was observed especially in NRW management. It influenced on developing technical capacity of entire NRW counterparts and fostering internal trainers.

## 2) Delay in equipment procurement

Equipment procurement for NRW pilot project was significantly delayed from the original schedule, which was caused by long time examination and approval process in Japanese side. It led to belated start of the pilot project, and automatically influenced on trainings and development of internal trainers for NRW management.

### 3-3. Efficiency

## Efficiency of the Project is moderate.

Expert's assignment was flexibly adjusted not only in assignment timing but also in the variety of experts' assignment fields in accordance with the Project progress and necessity. Manpower input by Japanese side is evaluated efficient and effective. Component of the expert team comprising various organizational background is also highly evaluated.

Myanmar side also made an effort to assign counterparts and to keep them stay, though, there were actually frequent changes and/or leave of counterparts especially in NRW management, which gave influence on seamless technical transfer.

The delay in equipment procurement also gave influence on a series of activities of NRW management. On the other hand, the third-country training was an efficient and effective inputs contributing to the Outputs and the Project purpose.

Overall, the efficiency is evaluated moderate.

## 3-3-1 Manpower inputs

1) Japanese side

Japanese side flexibly adjusted experts' assignment in accordance with the Project progress and other needs identified in the course of the Project implementation. It is evaluated the manpower inputs are efficient and effective. The Project added experts on "customer services/water billing collection", "Design and supervision for flow meter chamber" responding to the necessity arisen during the Project implementation. Assignment period of experts also flexibly adjusted according to the progress of the NRW pilot project. In addition, it should be highly evaluated that component of the expert team which are made of a consulting company, local government group/line companies, a manufacturing company, and a stationed long-term expert enabled to enrich the Project activities.

#### 2) Myanmar side

It is highly evaluated that Myanmar side made an effort to assign counterparts as much as possible under

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the strict employment rule. However, as pointed out in the inhibition factor, there were actually many cases of job resignation, which caused negative effects in technical transfer to counterparts. In addition, there was a tendency to concentrate job assignment on middle age/class staffs, which are not only the Project's but also their original tasks in their divisions. Such fully occupied working environment sometimes made them difficult to attain the Project activities.

It is, however, necessary to point out the positive prospect as well. Staffs still working as counterparts are all highly committed to the Project with ownership mind. They are expected to continue working and will play key roles of water supply services in YCDC. Focusing on only counterparts remained until now, efficiency of technical transfer was satisfactorily confirmed.

# 3-3-2 Physical inputs: Equipment/Facility

Equipment provided by the Project are all necessary items for the Project activities. They have been well utilized and contributed to achievement of the Outputs and the Project purpose. The variety of equipment covers not only the ones for field works but also for office work. Equipment for office work created noteworthy effects as follows. At the time of the Project started, the number of computers at township offices as well as YCDC headquarters was quite limited. A lot of works had to be done by manual basis, which brought challenges in efficiency of works and accuracy of data inputs. Owing to installation of computers and continuous training of computer skills in the newly established computer training room in the Project, they are now able to manage data on PIs, customer services and others. It is evaluated that this input contributed to achievement of the Output 1 and accordingly the Project purpose.

Selection of equipment is also evaluated reasonable. Myanmar side recognized advantage of the functions and usability of some items, for example, ultrasonic flowmeter and portable test meter. YCDC has already purchased them additionally by their own budget.

On the other hand, there was a delay in procurement of NRW equipment. The negative effects caused by this event was abovementioned in the inhibition factor.

# 3-3-3 Training in Japan and the third-country

Training in the third-country created immense effects as mentioned in the contribution factor. Training in Japan was also effective for counterparts to Jearn the water supply utility management at global standard level and to have future picture in the mid-long run perspective.

#### 3-3-4 Budget

JICA flexibly increased budget amount allocated to the Project from the original estimate in response to additional needs recognized in the course of the Project. Though the entire request from the Project was not met due to the limitation of the JICA's budget, budget amount and the disburse timing from both YCDC and JICA did not cause major negative effects for the Project activities.

YCDC disbursed budget as planned in general, and sometimes quickly did, responding to decision by top management strata.

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3-3-5 Supplementary effects and duplication activities	Technical aspect
Mapping information made by JICA "Yangon Mapping Project" gave supplementary effects to the Project	<ul> <li>Recognition as a leading laboratory in water supply organizations</li> </ul>
especially for development of NRW management plan of the pilot site.	The central laboratory received the visit from Mandalay City Development Committee, MCDC, and
Close communication with a long-term expert "water supply supervisor" in YCDC also made positive and	provided technical instruction in response to their requests in October 2019. YCDC laboratory staff gave
supplementary effects in terms of information sharing especially other donors' projects. Information	introduction of analytical method of coliform bacilli, SOPs in currently use, and brief instruction of the
sharing helped the Project avoid unnecessary duplication.	analytical equipment. In addition, Myanmar border development committee also visited the central
	laboratory.
3-4. Impact	The reputation of the central laboratory has been gradually extended within Myanmar as one of leading
Impact of the Project is high.	laboratories in water supply organizations, which would entail the roles of instructors such as they did to
Achievement of the Overall goal "improvement of water supply services by YCDC" is highly prospected,	MCDC.
considering the YCDC's proactive development efforts with corresponding budget, plans of donor projects	
and asset of the Project including technical knowledge and skills. Ripple effects are also observed in	Formulation of SOPs
organizational and technical aspects as well.	Divisions and sections not directly involved in the Project in EDWS have also formulated their SOPs,
The impact is evaluated high.	following the SOPs formulation exercises by counterparts.
3-4-1 Ripple effects	Organizational aspect
The following nipple effects by the Project are observed.	SS and Kaizen
	The Project invited all the divisions and sections to the seminars of 5S and Kaizen. The effect of the
Organizational and technical aspects	seminars is now observed in many divisions and sections. The environment of the offices is now much
<ul> <li>Further and/or supplementary development actions by YCDC's initiative</li> </ul>	more organized in terms of document storage/sorting and others.
Using technical knowledge and skills gained through the Project, YCDC is now newly promoting	
development efforts for better water supply services with their own budget. Primary examples are as	<ul> <li>Staffs moved to Wastewater and Drainage Department</li> </ul>
follows	Many of counterparts who received technical transfer moved to Wastewater and Drainage Department in
YCDC initiated an NRW management pilot project in North Okkalapa with their own initiative	April 2019 under reorganization process to an Authonity. The staffs transferred to the Department has been
and budget, applying the skills and knowledge learned in the Project such as setup of District	working with higher quality and skills they gained through participation in the Project. The effect of the
Metered Area, DMA, analysis and design of distribution pipeline network, and others.	Project has been spreading to another organization through such personnel transfer.
Confirming the effectiveness of the pilot project in Nyaunghnapin water treatment plant, which	
tested the modified design of rapid sand filter, sedimentation tank and others, YCDC determined	Negative impacts are not observed.
to apply the design and the way of operation to entire Nyaunghnapin water treatment plant.	
Construction of hoppers and some modification has already started as of the Terminal evaluation.	3-5. Sustainability
Necessary budget is already secured.	Sustainability of the Project is moderate.
> Small scale pilot project of untreated water from Hlwaga and Gyopyu reservoir has shown	It is highly likely for Myanmar and Yangon local government to continuously stress importance on water
positive results. YCDC determined to proceed the next step to enlarge the test scale.	supply services. The policy aspect has high sustainability. On the other hand, legal and regulation is
	necessary to accelerate their development and enforcement including Water Supply Regulation.
In addition, YCDC recently opened the Training center for NRW management in January 2020, which has	As to sustainability of organizational aspect, high sustainability is confirmed on organizational structure,
training yard and building for classroom training. It is expected for this center to provide trainings to not	while there are challenges in shortage of permanent staffs and job leave. Technical sustainability has been
only YCDC coverage area but also to the rest of Myanmar.	upgraded significantly through the Project, though, there are still untouched technical fields and shortage
	of internal trainers.
	Financial sustainability from macro viewpoint depends on if the water tariff can increase or not as planned.
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Constitution these associes the sustainabilities is evaluated moderate	1.5.4 Rinomial across
coustants ing more asycony are desaurating to evaluation incovativ.	
	Myaumar summary and strong will to unprove water supply services can be continued in new facturies
3-5-1 Policy and legal/regulation aspects	construction including the Training center for NRW management, purchase of equipment such as ultrasonic
Improvement of water supply services is one of the top priorities in the national and Yangon city local	flowmeter, and commencement of the NRW pilot project in North Okkalapa. Considering these examples
government. The importance is highly prospected even after the Project. Sustainability of policy aspect is	of actual implementation, a certain degree of budget allocation by Myanmar side is prospected even after
evaluated high. As for legal aspect, law and regulation related with water supply services have been	the Project ends.
developing step by step until now. However, in order to realize stable and reliable water supply services,	On the other hand, looking at the financial sustainability from much more macro viewpoint, it may depend
further efforts to develop law and regulation are strongly required.	on if water tariff is able to increase or not up to the level where necessary costs can be accommodated. In
	order to realize necessary investment and/or budget allocation for improvement of water supply services,
3-5-2 Organizational aspect	proper level of water tariff is one of the most important conditions. If the gradual increase in water tariff is
EDWS has a reasonable organizational structure to engage in their tasks, which defines roles and	realized, the financial sustainability would be possibly enhanced as well.
responsibility that each division/section has. There are no concerns from the viewpoint of organizational	
structure. Contrary to the reasonable structure, challenging issues are shortage of staffs at some	3-6, Conclusion
divisions/sections, and large portion of non-permanent staffs. Employment condition of non-permanent	The Project took approaches from three (3) aspects for capacity development, which are 1) organizational
staffs, who may have narrow chances to promote to permanent staffs under the severe employment rule, is	and institutional aspect, 2) operational aspect, and 3) technical aspect. Steady progresses are confirmed at
possibly affecting their motivation and sometimes leading to job resignation.	all the aspects, indicating the Project almost achieved the purpose including the indicators' viewpoints as
It is noted that transition of EDWS to Authority which is now under official approval process does not	of now. The degree of the achievement status can be higher by the end of the Project.
create a significant change in their roles and operation for the time being.	The Project faced some challenges such as development of internal trainers due to delay in equipment
	procurement and frequent changes/leaves of counterparts, which affected efficiency of technical transfer.
3-5-3 Technical aspect	On the other hand, it should be highly noted that the Project produced various impacts on organizational
It is confirmed that the skills and knowledge of EDWS/YCDC has significantly upgraded during the Project	and technical aspects such as YCDC's proactive development efforts in water supply services.
period. However, questioning if EDWS/YCDC can independently offer stable and reliable water supply	Overall, it is evaluated that Project has satisfactorily progressed towards achievement of the purpose in line
services or not, their technical capacity has to be evaluated still in developing stage.	with the needs of YCDC. Implementation of the Project is judged quite meaningful and effective towards
The background of this judgement is, firstly, that there are some facilities that are not yet functioned such	improvement of water supply services in Yangon city.
as chlorination facilities and Lagunbyin water treatment plant. EDWS/YCDC staffs themselves expressed	
their concerns if they are able to deal with their technical requirements or not to these new facilities.	4. Recommendations
Secondly, completely new issues may appear such as PPP, which even the Project has not addressed yet.	4-1. Recommendations within the Project period
Technical concerns from financial management, legal setup and others may need to be addressed in the	The Team recommends the Project to take the following actions:
near future.	4-1-1 Completion of products and/or activities under development
Another issue of technical sustainability is securement of human resources as internal trainers. Water	a. Output 1
quality management field already has targeted number of staffs, while other fields including NRW	1) Completion of trials of the customer management system
management has not reached the target. This is another concern for technical sustainability.	To finalize the customer management system whose software application is now under
However, it is also noted that enrichment of hardware aspect including the Training center for NRW	development, and to conduct tests of its functionality and effectiveness in pilot townships.
management where systematic trainings can be offered and of software aspect such as training materials	
and SOPs formulated in all the divisions/sections is a crucial asset which can function as technical	2) Final approval and implementation of human resources development and management plan
development infrastructure and/or system. Using these assets, it is expected to enhance technical	including countermeasures to job resignation challenges
sustainability.	Towards improvement of job resignation as YCDC's continuous challenges, not only to approve
	the plan but also to start implementation of whatever countermeasure ideas presented in the plan.
	Even if they are trivial issues, taking the first step will be quite meaningful.
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To share and use effectively data of flowmeter, GIS, MKPIs and others in YCDC.	
b. Effective use of data and materials	on and distribution management by the cross-
To take necessary countermeasures of flowmeters which are not properly functioned.	
a. Flowmetter	atisfy the indicator of the Overall goal of the
4-1-2 Equipment and materials	eline and corresponding necessary budget in
effectuate a cycle of SOPs elaboration, application and review/improvement is quite important.	
Planning section, to consider feasible audit mechanisms, and to implement auditing actually. To	ad to utilize them.
It is important to audit how all the works are conducted in line with SOPs. With a leadership of	
d. Common issue	
PDM, which has been blanked until now.	trainers in YCDC for such growing demands
management plan. It automatically can satisfy the indicator of the Overall goal of the Project's	ent launched in January 2020, the demand of
Escherichia coli, necessary timeline and corresponding necessary budget in the water quality	scome internal trainers of NRW management.
To determine the target figures of water quality such as turbidity, residual chlorine or Fecal	agement
12) Concretization of water quality management plan	
experts.	đ
staffs are not yet confident, and to start necessary actions and/or trainings in consultation with	R activities with PR section and other
start. Towards their proper operation, to identify necessary skills and knowledge of which YCDC	ich may be caused by the launch of new
Full scale operation of chlorination facilities and Lagunbyin water treatment plant are about to	ugh multimedia including SNS especially on
operation yet	
11) Further capacity development and/or technical countermeasures for facilities not in	
c. Output 3	and emergency of Water Supply Regulation.
which definitely contribute to improving water supply system in Yangon city.	<ul> <li>Regulation as soon as possible. Towards tandings of decision makers including Mayor</li> </ul>
The evaluation team recommends the working team continue these study works and produce further outputs,	
Establishment of Transmission and Distribution Management Section	
Estimation of monthly NRW ratio in the entire system	
the pipeline system and operation method	en to proceed the next stage of "A" where
Identification of improvement measures for distribution management by modification of	the Planning section. To conduct detailed
Simulation of existing system and the problem areas by the model prepared	once. The Project is now at the stage of "C",
Construction of hydraulic model for Transmission system	
Ensuring proper functioning of the flow meters installed	
team is now working for the following outputs:	with the expert.
sections of District Office, GIS, NRW, Transmission Pipe, and House Connection. The working team is now working for the following outputs:	Project period. Towards its completion, to with the expert.

3) Financial management

To complete the asset inventory within the Project period. Towards its comple accelerate elaboration efforts in consultation with the expert.

#### 4) Planning

To go through all the steps of PDCA cycle at least once. The Project is now at the stage of "C as monitored data on MKPIs has been reported at the Planning section. To conduct details analysis of MKPIs data at the "C" stage and then to proceed the next stage of "A" whe corresponding activities are carried out.

### 5) Law and regulation

To complete the draft version of Water Supply Regulation as soon as possible. Toward realization of its earlier approval, to promote understandings of decision makers including Mayo and regional government regarding the importance and emergency of Water Supply Regulation

### 6) Public Relations

To keep continuous efforts of public relations through multimedia including SNS especially on the changes of water quality and/or tastes, which may be caused by the launch of new chlorination system operation. Collaborative PR activities with PR section and other corresponding sections/division are also encouraged.

#### b. Output 2

7) Development of internal trainers of NRW management

To continue training activities for counterparts to become internal trainers of NRW management. Since the new Training center for NRW management launched in January 2020, the demand of trainings is highly likely to grow. To have internal trainers in YCDC for such growing demands is emergent needs.

# 8) Completion of SOPs and training materials

To complete SOPs and training materials sooner and to utilize them

# 9) Concretization of NRW management plan

To determine the target NRW ratio, necessary timeline and corresponding necessary budget in the NRW management plan. It automatically can satisfy the indicator of the Overall goal of the Project's PDM, which has been blanked until now.  Further development of capacity of transmission and distribution management by the crosssectional working team

YCDC needs to supervise water supply services provided by private entities in order to ensure PPP may trigger job leaves to private entities of some staffs. Considering such events, YCDC always need to keep human resources development efforts. Such continuous efforts can avoid and/or mitigate possible risks caused by job resignation of staffs, and also the staffs who may be ransferred from YCDC to the private entities are trained to be skillful to bring benefits to better The detailed planning survey of the Project determined the basic fields to deal with in a project, but intentionally did not determine detailed activities contents as well as PDM indicators. The planning survey encouraged counterparts and experts to consider and determine the activities and PDM indicators through enabled to avoid mismatch of the technical needs and the Project plan. Also, the initial process of workshops As the long-term expert received the assignment as a deputy leader of the JICA expert team, the role and requires to deal with many technical and administrative issues instead of other shuttle style experts, the The third-country training in Cambodia provided the Project with significant effects. Prior to the training, of the training. In other words, this third-country training was implemented with clear strategy, which had been asking the participants what to learn and what to produce after the training, which the Project called "research style" training. Such strategic training is quite effective in terms of efficiency of training as well relatively recently is also effective. The training not only gives counterparts technical knowledge but also END 27 workshops and/or capacity assessment after the Project started. Such relatively open-styled planning and capacity assessment contributed to deepening mutual understanding as well as creating ownership mind power became clear besides the technical assignment. Since the expert stationed in Myanmar frequently the Project collected from participants what they want to learn and then sent information on their In addition, visiting a country that has development history on improvement of corresponding sector for In case for a long-term expert stationed alone, determination of clear roles and power among an expert team expectations to a recipient organization in Cambodia. Such prior arrangement enhanced the effectiveness Co 1. Process of designing the Project contents (description is repeated from Contribution factors) safe, reliable, and affordable water supply services with high quality in Yangon city clearly determined position made the long-term expert to accommodate such requirements. 2. Devices of implementation structure of a long-term expert and expert team raises their motivation from learning their development experiences. 3. Strategic implementation of the third-country training water supply services. Lessons learned as creation of ownership mind. in counterparts. is important. ő ÷ ŝ هن. 26 To make use of documents, handouts, which were distributed in the seminars and trainings in the Project, is also necessary. For this purpose, to consider how they can be stored and accessed in The new Training center for NRW management is likely to receive trainees from other provincial cities of monitoring from other laboratories in the country. The evaluation team recommends that YCDC will take To apply the customer management system to all the townships under YCDC area, once after YCDC has already determined to apply the design and the way of operation, which the Project has confirmed the effectiveness, to entire Nyaunghnapin water treatment plant. The evaluation Small scale pilot project of untreated water from Hlwaga and Gyopyu reservoir has shown positive results. The evaluation team recommends to proceed the next step to enlarge the test 4-2-2 Assignment of full time and permanent personnel and taking countermeasures against job To promote understandings of not only YCDC but also decision makers including Mayor and regional government on the importance of full time and permanent personnel assignment and countermeasures to Myanmar, and the central laboratory may also receive requests to instruct water quality analysis and Even if PPP is introduced in the future, continuous efforts of YCDC on institutional strengthening and YCDC as a public entity takes responsibility to set up entire plan and to monitor the water supply Con team recommends to proceed the application plan steadily as YCDC determined Recommendations after the Project including some in the Project period such actions and roles as a leading organization of water supply services in the country. 4-2-4 Continuous institutional strengthening and human resources development Application of the customer management system to all the townships human resources development are required due to the following reasons:

scale.

resignation

4-2-3 Leading role for other provincial cities

job resignation

The Team recommends Myanmar side to take the following actions:

YCDC.

Further utilization of the Project outputs

4-2-1

4-2.

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confirming the usability and effectiveness of the system

Application of outputs from Nyaunghnapin pilot project

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Implementation of pilot project by larger scale

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:2

Much works directly conducted by YCDC still remain.

69 ġ services in Yangon city.

	3-3 The number of trainers for water quality management becomes 4.		3-3 Evaluati sheet indicat check list to	on by JICA Experts based on a check ting necessary abilities for trainers. The be prepared in the project in advance.	
	3-4 EDWS staff participates in training based on training plan for water q	quality management.	3-4 Training Section).	attendance record, HRD report (HRD	
	3-5 The turbidity of treated water in pilot sand filter in Nyaunghnapin wa controlled less than 1 NTU.	ter treatment plant is	3-5 Activity	report of Taskforce team.	
	3-6 The operation and maintenance system of Lagunbyin water treatment	t plant is prepared.	3-6 Operation	on and maintenance organization Lagunbyin water treatment plant.	
	3-7 The operation and maintenance system of chlorination facilities is pre-	epared.	3-7 Operation	on and maintenance organization chlorination facilities	
[Activities]			[Lı	aputs]	
1. Capacity of YCDC on institutional mana	gement of water supply utility is improved.	Japanese side		<u>Myanmar side</u>	[Pre-condition]
<ul> <li>(1-1) Prepare overall new organization struc</li> <li>(1-2) Establish the Planning Section in (1-2-1) Establish the Planning Section in (1-2-2) Define the division of duties of th</li> <li>(1-3) Establish the Customer Service Division</li> <li>(1-3) Establish the Customer Service Division</li> <li>(1-3-2) Define the division of duties of th</li> <li>(1-3-2) Define the division of duties of th</li> <li>(1-3-2) Define the division of duties of th</li> <li>(1-3-2) Define the during the current method of call</li> <li>(1-4-2) Conduct training of trainers on th</li> <li>(1-4-3) Identify the important and availahours, NKW, etc.).</li> <li>(1-4-4) Install transmission flow meter at</li> <li>(1-4-5) Collect data required for setting 1(1-4-6) Collect data required for setting 1(1-4-6) Callect data required for distribution pi (1-5) Enhance understanding on financial and (1-5-1) Analyze the current financial man (1-6-2) Inplement training on financial at of future development plans (e.g. general setting, PPP, etc.)</li> <li>(1-7) Strengthen Public Relations</li> <li>(1-7-1) Analyze the effective public relati (1-7-2) Conduct ovarreness raising 0(7 (1-7-3) Conduct ovarrenes or financial man (1-6-2) Inplement training human resources development (1-6-3) Riengthen Public Relations</li> <li>(1-7-3) Conduct ovarrenes resing for 1(1-7-3) Conduct ovarrenes or financial man (1-6-2) Riengthen Public Relations (1-7-2) Canduct ovare</li></ul>	ture Department of Water and Sanitation te Planning Soction Division in Department of Water and Sanitation te United Strate Strate Strates Str	Experts     Consultant team     Chief Advisor/ Water S     Operation     Institutional Capacity E     // Human Resources M     Planning / Monitoring     Pinarcial / Business M     NRW (Physical Loss)     NRW (Commercial Los     G18     Operation and Mainten     Water Supply Facilitie     Nator: Quality Manager     Project Coordination     2) Experts from waterwo     Institutional Management     France/Losiness Manage     Regulation/Standard/Gui     Human Kesurces NW     Management (NRW Engi     Customers Service, Tariff     Water Quality Management     Treatment Engineering)     S. Equipment     Water leakage detector, Ec     and material for NRW reg     plot areas, Water quality Management     Treatment Engineering.     Water leakage detector, Ec     and material for NRW red     plot areas, Water quality     duargement, Equipment     system, Computers and pr     Software, etc.     S. Overseas Training in Japan and/or n     countries     4. Local cost	Supply Nevelopment anagement anagement sis) ance of sment (Planning, menting, collection), rol (Water Quality Water Quality Quipment ueuton in the analysis revalor sinters, meters, meters, sinters,	<ol> <li>Counterpart personnal</li> <li>Office space and facilities</li> <li>Necessary data' information</li> <li>Local cost for implementation of the activities</li> <li>Distribution flow monitoring</li> <li>To design and construct chambers for flow meters</li> <li>To stake sourity measures (constructing gales and fences for flow meters and other accessories)</li> <li>To supply electricity to the site</li> <li>Water quality monitoring</li> <li>To supply electricity to the site</li> <li>To all coater space in laboratory in Head Office for equipment procured.</li> <li>To all coate space for equipment in water treatment plant, pump station, and reservoir site.</li> <li>To procure reagents for file equipment procured by Japanese side (Japanese side will provide necessary amount for 6<sup>th</sup> month after procurem tentals which YCDC can procure locally and routinely</li> <li>To secure storage space for the equipment and materials procured</li> <li>To conduct civil works for construction of DMA (digging, priping, back-filling, and restoration)</li> <li>Collection of computerzed data for Performance indicators</li> </ol>	<ol> <li>Top management of YCDC show the strong leadership and commitment to the capacity development on institutional management</li> </ol>

#### Annex 1. Project Design Matrix

oject Sites : Greater Yangon rget Group : Staff of YCDC rect beneficiaries : Staff of YCDC direct Beneficiaries : People living in the water	supply areas of YCDC		PDM Version 3 (Au
Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assump
[Overall Goal]			
Water supply services provided by YCDC are enhanced.	<ol> <li>The management key performance indicators (MKPIs) are improved compared to the data at the Project commencement<sup>1</sup>.</li> <li>NRW is decreased from OO % to OO % in the water supply area of YCDC.</li> <li>The compliance ratio in terms of turbidity to meet the water quality standard is increased from OO% to OO%. The compliance ratio is increased from OO% to OO% in terms of residual chlorine (&gt;0.2 mg/l).</li> </ol>	<ol> <li>S/C2 activity record, MKPIs monitoring sheets.</li> <li>S/C1 activity record, MKPIs monitoring sheets.</li> <li>Water quality monitoring report, MKPIs monitoring sheets.</li> </ol>	
(Project Purpose)			YCDC will obtain externa
Capacity of YCDC on the management of water supply service is improved.	1. Steering Committees (S/C) are organized and improvement actions are implemented.	1. Appointment letter for S/C members, S/C1, 2, 3 activity record.	water treatment plant, disi facility and distribution pi
	2. Mid-term management plan is approved by EDWS.	<ol> <li>Approval of Mid-term management plan in S/C2, or approval letter of the Head of Department (CE).</li> </ol>	
	3. The implementation of mid-term management plan is monitored based on MKPIs.	3. MKPIs monitoring sheets.	
	<ol> <li>The two lado's grasped in the water supply service area or YCLX, and monitoren.</li> <li>Plan for NRW reduction is approved by EDWS.</li> </ol>	<ol> <li>NKW management report.</li> <li>Approval of Plan for NRW reduction in S/C1, or approval latter of CE</li> </ol>	1
	6. Water quality is grasped in the water supply service area of YCDC and monitored.	6. Monthly water quality monitoring report	
	7. Plan for improvement of water quality is approved by EDWS.	7. Approval of Plan for improvement of water quality in S/C2, or approval letter of CE	
Outputsi	And some the state of a loss of the		1.
1. Capacity of YCDC on institutional management of water supply utility is improved.	1-1 Plan for improvement of water bill collection is approved by EDWS.	1-1 Approval in S/C2, or approval letter of CE.	1
	1-2 Plan for human resources development is approved by EDWS.	1-2 Approval in S/C2, or approval letter of CE.	
	1-3 Drafts of regulations, standards and guidelines for water supply services in Yangon is approved by EDWS.	1-3 Approval in S/C3, or approval letter of CE.	
	1-4 New organization structure is approved by Mayor.	1-4 Approval letter, or approval process confirmed by the Experts.	1
	1-5 2 Full time staff members in Planning Section can give direction of PDCA cycle to EDWS staff.	1-5 Evaluation by JIC A Experts based on duties of Management Planning Unit in Planning Section in Report on Institutional Reorganization.	
<ol><li>Capacity of YCDC on NRW management is improved.</li></ol>	2-1 Manuals and training materials on NRW management are utilized by YCDC staff.	2-1 Manuals in relevant offices and training record.	
	2-2 Information of customers and pipes for the pilot areas is compiled and updated.	2-2 Pilot project activity report.	
	2-3 The number of trainers for NRW management becomes 8.	2-3 S/C1 activity record, Evaluation by JICA Experts based on a check sheet indicating necessary abilities for trainers. The check list to be prepared in the project in advance.	
	2-4 EDWS staff participates in training based on training plan for NRW management.	2-4 Training attendance record, HRD report (HRD Section)	
	2-5 NRW ratio is decreased to 25% in the pilot area.	2-5 S/C1 activity record, Pilot project activity report.	
<ol> <li>Capacity of YCDC on water quality management is improved.</li> </ol>	3-1 Manuals and training materials on water quality management are fully utilized by YCDC staff.	3-1 S/C3 monitoring report, manuals in relevant offices, training record.	
	3-2 Result of the water quality test by the central laboratory and on-site mini laboratory is recorded and monitored periodically.	3-2 Monthly water quality monitoring report,	

6 - 63

(2-6) Dovelop and support implementation of the NRW management plans (2-6-1) Develop 5-year and 10-year NRW management plans (2-6-2) Launch priority activities as a part of implementing the 5-year NRW management plan		1.1
3. Capacity of YCDC on water quality management is improved.		
(3-1) Establish Water Treatment Section (3-1-1) Establish Water Treatment Section in Department of Water and Sanitation (3-1-2) Define the division of duties of the Water Treatment Section (3-1-3) Hold a series of seminar for basic water treatment technology with study tours		
(3-2) Review current situation and formulate phased countermeasures		
(3-3) Conduct training of trainers on water quality management (3-3-1) Conduct training of trainers on the water quality management (3-3-2) Prepare the training plan and training materials by the trainers (3-3-3) Conduct Off-JT by the trainers		
(3-4) Develop SOP for water quality management (3-4-1) Develop SOP on water quality test and monitoring (3-4-2) Develop SOP on operation and maintenance of water treatment plant and disinfection facility		
(3-5) Conduct OJT on water quality management at the pilot treatment plants and disinfection facility (3-5) Procure water quality analysis and water quality management equipment (3-5-2) Conduct OJT on vater quality test and monitoring (3-5-3) Diagnose function of treatment processes of Nyaunghnapin water treatment plant (3-5-4) Develop improvement plane of Nyaunghnapin water treatment plant through pilot basin (3-5-5) Propare an improvement plan of Nyaunghnapin water treatment plant (3-5-5) Conduct OJT on operation and maintenance of water treatment plant and disinfection facility (3-5-7) Verify SOP for water quality management		
(3-6) Conduct OJT on improvement of water quality supplied from reservoirs (3-6-1) Review water quality problems in reservoir water (3-6-2) Research water quality improvement measure of reservoir suppled water		
(3-7) Develop and support implementation of the water quality management plans (3-7-1) Develop 5-year and 10-year water quality management plans (3-7-2) Launch priority activities as a part of implementing 5-year water quality management plan		

I Pls and their baseline data will be set approximately 1 to 2 year(s) after the Project commencement. Considering the monitoring results of Pls, target values of respective Pls will be discussed within the Project and decided by JCC.

V.

<ul> <li>(1.4.4) Develop 5-year and 10-year human resources development plans</li> <li>(1.4.5) Launch priority activities as a part of implementing the 5-year human resources development plan</li> <li>(1.9) Develop and support implementation of the institutional management plans</li> <li>(1.9-1) Develop 5-year and 10-year institutional management plans</li> <li>(1.9-2) Launch priority activities as a part of implementing the 5-year institutional management plans</li> </ul>	provided equipment (such as PCs) to each branch office. >> To secure space for installing PCs >> To procure consumates
2. Canacity of YCDC on NRW management is improved.	(including printer inks)
<ul> <li>[2. Capacity of YCDC on NRW management is improved]</li> <li>(2-1) Establish NRW Management Unit</li> <li>(2-1) Establish NRW Management Unit</li> <li>(2-1-2) Define the division of duties of NRW Management Unit</li> <li>(2-2-2) Define the division of MRW and implement a baseline survey</li> <li>(2-2-2) Compile information of NRW and implement a baseline survey</li> <li>(2-2-2) Compile information of NRW and implement a baseline survey</li> <li>(2-2-2) Compile customer information into database</li> <li>(2-3-3) Compile customer information of physical loss (leakage, over flow) and human resources development</li> <li>(2-3-1) Review current situation and develop phased countermeasures</li> <li>(2-3-1) Review current situation and develop phased countermeasures</li> <li>(2-3-1) Review current situation and develop phased countermeasures</li> <li>(2-3-3) Proper training of trainers intrough implementation of Non-revenue water (NRW) pilot project in North Okslapa</li> <li>(2-3-3) Proper training and trainers materials by the trainers</li> <li>(2-3-3) Conduct rainings of trainers</li> <li>(2-3-3) Conduct a pilot gas for NRW management activities</li> <li>(2-3-3) Proper tensing plan and training materials by the trainers</li> <li>(2-3-3) Conduct of DIT by the trainers</li> <li>(2-3-3) Conduct applicate loss</li> <li>(2-3-3) Proper tensing plan and procure equipment for the countermeasures to be taken for reducing physical loss in the pilot areas</li> <li>(2-3-4) Strup DMAs at the pilot areas</li> <li>(2-3-4) Strup DMAs at the pilot areas</li> <li>(2-3-4) Strup DMAs at the pilot areas</li> <li>(2-3-4) Conduct the outermeasures against physical loss in the pilot area and formulate the optimal model</li> </ul>	<ul> <li>➤ To bear necessary operational costs for the training.</li> <li>➤ To update ani-virus software periodically</li> <li>• Civil work (construction of flow meter chamber). Safety fence for flow meters and panels, and electricity supply for flow meter installation</li> </ul>
<ul> <li>(2-3-11) Implement OIT by the trainers in the pilot area</li> <li>(2-3-12) Vorify the manuals on physical loss</li> <li>(2-4) Develop a model on the management of commercial loss (meter fault, miss reading of meter; illegal connection) and human resources development</li> <li>(2-4-1) Review current situation and develop phased countermeasures</li> <li>(2-4-1) Review current situation and develop implementation of Non-revenue water (NRW) pilot project in North Okkalapa</li> <li>(2-4-3) Prepare training plan and training materials by the trainers</li> <li>(2-4-4) Formulate manuals on commercial loss</li> <li>(2-4-4) Formulate manuals on commercial loss</li> <li>(2-4-4) Formulate manuals on commercial loss</li> <li>(2-4-5) Prepare action plan and procurement of equipment for the countermeasures to be taken for commercial loss in the selected pilot area</li> <li>(2-4-7) Conduct the countermeasures against commercial loss in the pilot area</li> <li>(2-4-7) Conduct the countermeasures against physical loss in the pilot area</li> <li>(2-4-7) Vordiy the trainers in the pilot area</li> <li>(2-4-7) Vordiy the trainers in the pilot area</li> <li>(2-4-7) Vordiy the manuals on commercial loss in the pilot area</li> <li>(2-4-7) Vordiy the trainers in the pilot area</li> <li>(2-4-7) Vordiy the trainers in the pilot area</li> <li>(2-4-10) Verify the manuals on commercial loss</li> </ul>	
(2-5) Develop training yard for NRW management (2-51) Prepare training plan for training yard (2-52) Design training yard (2-53) Prepare squipment and materials for training yard (2-54) Construct training yard (2-55) Prepare training manuals and materials for training yard and conduct trainings of the trainers in training yard (2-56) Conduct OI/T1 FW to trainers in training vard	

Name of Counterparts	time	time	Section	Remarks
<b>Output 1-1: Planning (11 perso</b>	(SU	1		
1 U Zaw Min		>	Planning	
2 U Than Han		>	Planning	
3 Daw Khin San Win		>	Planning	
4 Daw Khaing Khaing Soe	>		Planning	
5 Daw Naw Ellinar		>	Yegu P.S	
6 U Tun Tun Hlaing		>	Pipe 1	
7 Daw Sandar Myint Lwin	>		Planning	
8 Daw Kyawt Kay Khine	>		Planning	
9 Daw Soe Yu New	>		Planning	
10 Daw Aye Aye Kyu		>	Pipe 1	
11 Daw Khin Eindra Htun		>	M&E	
Output 1-2: RSGM (WG - 3.1) (	4 perso	(suc		
1 Daw Thwe Naing Oo		>	EDWS	
2 Daw Thin Thin Soe		>	ACE, Supporting Section	
3 U Than Han		>	ACE, Reservoir Section	4
4 U Zaw Min		>	EE, Planning Section	
5 Daw Yu Yu Hia Baw		>	EE, NRW Management Section	
6 U Tin Win Aung		>	EE, House Connection	
7 U Tint Zaw		>	AE, Pipe 1	
8 U Aung Ko Oo		>	AE, Pipe 2	
9 U Chit Ko Ko		>	EE, West District Officer	
10 U Thant Zin Oo	Ĩ	>	EE, South District Officer	
11 U Nay Lin		>	EE, Head of four pipe sections	
12 U Kyaw Kyaw Oo		>	EE, North District Officer	
13 Daw Su Myat Bo Bo		>	Estimate Section	New Staff of 2018. Not n but involved a lot.
14 Daw Seint Swe Zin		N	Estimate Section	New Staff of 2018. Not r but involved a lot.
Output 1-2: RSGM (Sub Group	A under	WG 3	.1) (4 Person)	
1 U Tin Win Aung		V	House Connection	Member of WG 3-1
2 Daw Mar Mar Aye		>	Deputy District Officer (N)	
3 Daw Ye Mon		>	House Connection	
4 Daw Thin Thin Cho		~	Supporting Division	
Output 1-2: RSGM (Sub Group	3 under	WG 3	.1) (3 Person)	
1 Daw Aye Aye Mar		7	ACE, EDWS (CS & Computer)	
2 Daw Khin Khin Htwe		٧	Finance Section	
3 Daw Nimar Zin		~	Tamwe Township officer	
Output 1-2 : Finance (11 person	(s)			
1 Daw Khin Khin Htwe	N		Finance Section	
2 Daw Thin Thin Yee	V		Finance Section	
3 Daw May Thet Kyaw	>		Finance Section	
4 Daw Hnin Mya Khine	>		Finance Section	
5 Daw Ohnmar Soe	~		Finance Section	
6 Daw HIa HIa Htwe	>		Finance Section	Not nominated but
7 Daw Zarni Hlaing	>		Finance Section	Not nominated but

	0 1 0 0 7 U	Name Ms. Yariuchi Mina Ms. Yariuchi Mina Ms. Yariuchi Mina Ms. Yariuchi Mina Ms. Yariuchi Mina	Deputy Chief Advisor/ Institutional Capacity Developm Deputy Chief Advisor/ Institutional Capacity Developm	Duration Jul. 2015 - Mar.2016 Apr. 2018 - Mar.2017 Apr. 2017 - Mar.2019 Apr. 2019 - Nov.2019	Days	Days 180 321 350 350 270	Mum 6.00 12.00 12.00 9.00	49.7
F	Shoi	rt-Term Experts	Field	Duration	Days	J Davs	W/W	Total
	-	Mr. Sato Hirotaka	Chief Adviser / Water Supply Operation	Jul. 2015 - Mar.2016	122	5 127	4.3	
	NO	Mr. Ohno Atsuo Mr. Mateui Voli	Deputy Chief Advisor/ Waterworks Planning and Einancial / Businese Management	Jul 2015 - Mar 2016	104	10 114	4.0	
	PA	Mr. Okada Akihiro	Non-Revenue Water Management (Phisical Loss)	Jul. 2015 - Mar.2016	149	5 154	5.2	
346	10 4	Mr. Akanuma Tadashi Mr. Vichido Shionito	Non-Revenue Water Management (Non-Phisical	Jul. 2015 - Mar.2016	169	169	5.6	A 70
2	10	Mr. Terashima Katsuhiko	Operation and Maintenance of Water Supply Facilities	Jul. 2015 - Mar. 2016	114	111	3.8	1.
	00	Mr. Morita Yasuhiko Ms. Yamada Shoko	Water Quality Management Assistant for Water Operation	Jul. 2015 - Mar.2016 Jul. 2015 - Mar.2016	114	5 119	41	
	10	Ms. Hsumon Win	Coordination / Assistant for Waterworks Planning and	Jul. 2015 - Mar.2016	90	66	3.0	
	-	Mr. Sato Hirotaka	Chief Adviser / Water Supply Operation	Apr. 2016 - Mar. 2017	134	10 144	5.0	
	2	Mr. Ohno Atsuo	Waterworks Planning and Monitoring	Apr. 2016 - Mar. 2017	127	8 135	4.6	
	04	Mr. Okada Akihiro	I Financial / Business Management [Non-Revenue Water Management (Phisical Loss)	Apr. 2016 - Mar. 2017 Apr. 2016 - Mar. 2017	1201	5 125	4.3	
910	5	Mr. Akanuma Tadashi Mr. Kabida Shinouta	Non-Revenue Water Management (Non-Phisical	Apr. 2016 - Mar. 2017	123	123	4.1	38.1
	L	Mr. Terashima Katsuhiko	Operation and Maintenance of Water Supply Facilities	Apr. 2016 - Mar 2017	126	126	42	
	80 0	Mr. Morita Yasuhiko	Water Quality Management	Apr. 2016 - Mar. 2017	1001	5 105	3.6	
	10	Mr. Kamioka Motohiro	Assistant for Water Operation Flowmeter Chamber Design and Supervision	Apr. 2016 - Mar 2017 Apr. 2016 - Mar 2017	82	14/ 82/	22	
	-	Mr. Sato Hirotaka	Chief Adviser / Water Supply Operation	Apr. 2017 - Mar. 2018	62	8 87	3.0	
	cie	Mr. Ohno Atsuo	Waterworks Planning and Monitoring	Apr. 2017 - Mar.2018	86	101 8	3.7	
	04	Mr. Saito Yutaka	Prinancial / Business Management Customer Management/ Tariff Collection	Apr. 2017 - Mar 2018	81	CLL LL	70	
	Ð	Mr. Okada Akihiro	Non-Revenue Water Management (Phisical Loss)	Apr. 2017 - Mar. 2018	150	9 159	5.5	
240	9	Mr. Kiehida Shinenka	Non-Revenue Water Management (Non-Phisical	Apr. 2017 - Mar.2018	183	187	6.3	+ 00
	8	Mr. Terashima Katsuhiko	Operation and Maintenance of Water Supply Facilities	Apr. 2017 - Mar. 2018	116	2 118	4.0	1.00
1	0	Mr. Morita Yasuhiko	Water Quality Management	Apr. 2017 - Mar. 2018	101	7 108	3.7	
	11	Mr. Kamioka Motohiro	Passistant for vvater Operation Flowmeter Chamber Design and Supervision.	Apr. 2017 - Mar.2018	200	200	0.3	
	12	Ms. Hsumon Win	Coordination / Assistant for Waterworks Planning and	Apr. 2017 - Mar. 2018	30	0	1.0	
	-	Mr. Sato Hirotaka	Chief Adviser / Water Supply Operation	Apr. 2018 - Mar 2019	69	69	23	T
1	CNIC	Mr. Ohno Atsuo	Waterworks Planning and Monitoring	Apr. 2018 - Mar. 2019	125	125	42	
	24	Mr. Saito Yutaka	Customer Management/ Tariff Collection	Apr. 2018 - Mar.2019	21	21	0.70	
	50	Mr. Karino Toshio	Customer Management/ Tariff Collection	Apr. 2018 - Mar.2019	21	21	0.7	
018	10	Mr. Akanuma Tadashi	Non-Revenue Water Management (Mon-Phisical Loss) Non-Revenue Water Management (Non-Phisical	Apr. 2018 - Mar 2019	190	1001	0.0	36.2
	00	Mr. Kishida Shinsuke	GIS	Apr. 2018 - Mar. 2019	64	64	21	
	10	Mr. Terashima Katsuhiko Mr. Morita Yasuhiko	Operation and Maintenance of Water Supply Facilities Water Ouality Management	Apr. 2018 - Mar 2019 Apr. 2018 - Mar 2019	135	135	45	
	11	Ms. Yamada Shoko	Assistant for Water Operation	Apr. 2018 - Mar 2019	49	49	1.6	
	12	Ms. Shido Mayu	Coordination / Assistant for Waterworks Planning and	Apr. 2018 - Mar. 2019	67	67	2.2	
	٢	Mr. Sato Hirotaka	Chief Adviser / Water Supply Operation	Apr. 2019 - Nov.2019	73	6 79	27	
	2	Mr. Ohno Atsuo	Waterworks Planning and Monitoring	Apr. 2019 - Nov. 2019	67	6 73	25	
	n d	Mr. Matsur Yoji Mr. Karino Toshio	Irinancial / Business Management Customer Management/ Tariff Collection	Apr. 2019 - Nov. 2019 Apr. 2019 - Nov 2019	781	2 51	1.0	
610	5	Mr. Okada Akihiro	Non-Revenue Water Management (Phisical Loss)	Apr. 2019 - Nov.2019	149	149	5.0	OVC
Ĩ	6	Mr. Akanuma Tadashi Mr. Kishirta Shineuke	Non-Revenue Water Management (Non-Phisical	Apr. 2019 - Nov.2019	138	138	4.6	2.14
	8	Mr. Terashima Katsuhiko	Operation and Maintenance of Water Supply Facilities	Apr. 2019 - Nov.2019	74	74	25	Ì
	5	Mr. Morita Yasuhiko Ms. Yamada Shoko	Voter Quality Management Assistant for Water Oneration	Apr. 2019 - Nov.2019	105	105	3.5	
				The second s	2874	1. The second second		174.6

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	U Mvint Zaw Than			ICE Leader	
0	11 Zaw Oo	>		WITD	
n I	U Zaw Win Aund		>	Water Treatment Section	
4	Daw Ei Khaing Mon	>		Water Quality Monitoring	
ŝ	Daw Thidar Su Su Khin	>		WTP	Not nominated but involvation
9	Daw May Thawdar Oo	>	1	WTP (Dy Supv:)	Not nominated but involvation
~	Daw Thet Htet Myat		>	WTP	Not nominated but involvation
00	U Thit Lwin	>		WTP	
6	U Phone Thet Naing		>	Hlawga Reservoir	
10	Daw May Zin Oo	~		Water Quality Monitoring	
7	Daw Nwe Nwe Zin	~		Water Quality Monitoring	
12	U Zin Min Latt		>	Water treatment	
1m	Daw Aye Aye Thu Zar	~		Water Quality Monitoring	
14	Daw Tinzar Lwin	>		Water treatment	
no	tput 2: Yankin NRW Pilot P	roject (5	perso	us)	
-	U Myo Thant Htun	>		SAE, NRW Section (Field	
ſ	11 District Lines Interest			manager)	
		>		FIAT (NKVV SECTION)	
. 4	Daw Zin New On	> >		Flat (NKW Section) Skill W - 5 (Tamwe Tch)	
5	U Sithu Win	>		WA (Pazundaung Tsh)	
Tra	nsmission and Distribution	Manager	ment	Team	
1.1	<b>/ater Demand Estimation T</b>	eam			
-	U Tin Win Aung	~		EE, House Connection	Leader
N	U Kyaw Kyaw Oo	>		EE, East District	Member
m	U Chit Ko Ko	~		EE, West District	Member
4	U Thant Zin Oo	>		EE, South District	Member
5	U Nay Lin PANET Hvdraulic Modeling	Team		EE, Transmission Pipe Section	HMember
-	U Zaw Win Aund	~		EE. GIS Section	ll eader
N	U Ye Zay Ya	>		Flat, GIS Section	Member
m	Daw May Myat Mon	>		Flat, GIS Section	Member
4	Daw Aye Myat Thu	>		Flat, GIS Section	Member
н. В.	ransmission Flow System A	nalysis Te	am		
-	U Tint Zaw	~		AE, Pipe Section 1	Leader
N	U Aung Ko Oo	>		AE, Pipe Section 2	Member
m	U Than Win	>		SAE, Pipe Section 3	Member
4	U Aung Ko Ko Tin	>		SAE, Pipe Section 4	Member
4.4	RW Estimation Team				
-	Daw Yu Yu Hla Baw	>		EE, NRW Section	Leader
2	Daw Mi Mi Khine	>		AE, NRW Section	Member
m	U Aung Min Oo	>		SAE, NRW Section	Member
4	III Van Nainer Tun	~		SAE. NRW Section	Mamhar

	0		Einanra Cartion	Naw Ctaff
9 U Zavvar Tun	>>		Finance Section	New Staff
10 D Yin Min Thu	>		Finance Section	New Staff
11 Daw Thazin Wai Phyo Khine	N		Finance Section	New Staff
Output 1-3 : Human resource o	levelopm	ent (	9 persons)	
1 U Tin Win Aung		>	EE, House Connection	
2 U Kyaw Kyaw Oo		>	EE, East District Officer	
3 Daw Swe Swe Win	>		EE, HRD Section	
4 Daw Su Nandar Lin		>	AE, Research Section	
5 U Aung Moe Kyaw		>	E&M Section, Reservoir	
6 Daw Khin Zin Mar Myint	>		HRD Section	
7 Daw Wine Htet Htet Aung	N		HRD Section	2018 New Staff
8 Daw May Htoo Aung		>	Office Section, Reservoir	
9 U Pai Thu Ko	>		HRD Section	2019 New Staff
Cutanity 1 . Cutamore continue	110 0000	1		
1 Daw Ave Ave Mar			Customer Senire Mont	
2 Daw Khin Hav Min	> >		Customer Senice Most	
2 Daw Win Da Da Coa	> >		Customer Senire Mont	
4 Daw Ave Ave Moe		>	Finance Section	
5 Daw Sanda Htav		>	Finance Section	
6 Daw Wah Wah Aund		>	Computer Section	
7 Daw Thel Su Hsu Wai	>		Customer Service Mngt	2018 New Staff
8 Daw Hnin Lae Lae Win	v		Customer Service Mngt	2018 New Staff
9 Daw Mi Mi Lay Maung	>		Customer Service Mngt	2019 New Staff
10 Daw Saw Yu Nandar	~		Customer Service Mngt	2019 New Staff
		Ì		
Output 1-5 : PR (5 persons)				
1 Daw Thin Thin Soe		>	ACE, Supporting Section	
2 Daw Ohmar Aung		>	House Connection	
3 Daw Nwe Ni Win		>	Supporting Section	
4 U Htay Naing		>	Deputy District Officer (East)	
5 Daw Thandar Htwe		>	House Connection	
Output 2:NRW (16 persons)	10 11			
1 Daw Aye Pa Pa Nyo		>	ACE, Leader	
2 Daw Yu Yu Hla Baw	~		NRW Section	
3 U Aung Min Oo	~		NRW Section	
4 U Myo Thant Htun	>		NRW Section	
5 U Yan Naing Tun	>		NRW Section	
6 Daw Win Sandar Oo	>		NRW Section	
7 Daw Htwe Htwe Nu	>		NRW Section	
8 Daw Win Maw	>		NRW Section	
9 U Kaung Zaw Htet	>		NRW Section	
10 U Phyo Han Kyaw	>		NRW Section	
11 Daw Yu Khin Khin Kyaw	~		NRW Section	
12 Daw Htet Wai Hnin	>		NRW Section	
13 Daw Su May Thea Hlaing	~		NRW Section	
14 Daw Phyu Phyu Myint Myat	>		NRW Section	
15 Daw Zin Mar Htwe	>		NRW Section	
16 U Aung Hlaing Phyo	N		NRW Section	

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Annex 4. Counterpart training in Japan and the third-country

Training Course	No. Name	Position	Period	
Water Supply	1 Mr. Myo Thein	Deputy Head of Department	20/11/2016 ~ 2	5/11/2016
Managament	2 Mr. Khin Maung Phoo	Assistant Chief Engineer	20/11/2016 ~ 2	5/11/2016
INIALAGENEEN	3 Mr. Nav Lin	Executive Engineer	20/11/2016 ~ 2	5/11/2016
(INIVVA, Indiana)	4 Mr. Zaw Min	Executive Engineer	20/11/2016 ~ 2	5/11/2016
	5 Mr. Than Han	Executive Engineer	20/11/2016 ~ 2	5/11/2016
	6 Ms. Aye Pa Pa Nyo	Executive Engineer	20/11/2016 ~ 2	8/11/2016
	7 Ms. Moe Moe Khine	Executive Officer (Finance)	20/11/2016 ~ 0	1/12/2016
	8 Ms. Khin San Win	Assistant Engineer	20/11/2016 ~ 0	1/12/2016
	9 Ms. Yamin	Sub-Assistant Engineer	20/11/2016 ~ 2	9/11/2016
	10 Ms. Khin Zin Mar Myint	Programmer	20/11/2016 ~ 2	9/11/2016
Water Supply	1 Ms. May May Thwe	Committee Member	15/01/2017 ~ 2	0/01/2017
Management	2 Mr. Myint Oo	Head of Department	15/01/2017 ~ 2	1/01/2017
Indiageneric	3 Mr. Thet Lwin	Assistant Head of Department	15/01/2017 ~ 2	1/01/2017
ILLANDA, California	4 Ms. Thwe Naing Oo	Assistant Head of Departmen	15/01/2017 ~ 2	1/01/2017
	5 Ms. Thin Thin Soe	Executive Engineer	15/01/2017 ~ 2	0/01/2017
	6 Ms. Su Nandar Lin	Assistant Engineer	15/01/2017 ~ 2	4/01/2017
	7 Ms. Khaing Khaing Soe	Sub-Assistant Engineer	15/01/2017 ~ 2	4/01/2017
	8 Ms. Ohmma Myint	Sub-Assistant Engineer	15/01/2017 ~ 2	5/01/2017
	9 Ms. Aye Pyae Aung	Sub-Assistant Engineer	15/01/2017 ~ 2	5/01/2017
	10 Ms. May Thet Kyaw	Accountant -3	15/01/2017 ~ 2	4/01/2017
Distribution and NRW	1 Mr. Myo Thein	Deputy Head of Department	25/09/2017 ~ 0	3/10/2017
Management, and	2 Mr. Thant Zin Oo	Executive Engineer	25/09/2017 ~ 0	3/10/2017
Rilling and Collecting	3 Ms. Aye Pa Pa Nyo	Executive Engineering	25/09/2017 - 0	3/10/2017
Manadamant	4 Ms. Aye Aye Mar	Executive Engineering	25/09/2017 ~ 0	5/10/2017
	5 Ms. Yu Yu Hla Baw	Assistant Engineer	25/09/2017 ~ 0	7/10/2017
(PPWSA, Cambodia)	6 Ms. Khin Htay Win	Assistant Engineer	25/09/2017 ~ 0	5/10/2017
	7 Ms. Nwe Ni Win	Assistant Engineer	25/09/2017 ~ 0	5/10/2017
	8 Ms. Lin Lin Chit	Sub Assistant Engineer	25/09/2017 ~ 0	5/10/2017
	9 Mr. Aung Min Oo	Sub-Assistant Engineer	25/09/2017 ~ 0	7/10/2017
	10 Ms. Win Sandar Oo	Assistant Supervisor	25/09/2017 ~ 0	7/10/2017
	11 Ms. Htwe Htwe Nu	Assistant Supervisor	25/09/2017 ~ 0	7/10/2017
	12 Ms. Ms. Win Pa Pa Soe	Account-3	25/09/2017 ~ 0	5/10/2017
O&M of Water Treatment	1 Mr. Myint Zaw Than	Deputy Head of Depart	12/02/2018 ~ 2	3/02/2018
Plant and Water Quality	2 Mr. Zaw Win Aung	Assistant Engineer	12/02/2018 ~ 2	3/02/2018
Management	3 Ms. Tin Zar Lwin	Deputy Supervisor	12/02/2018 ~ 2	3/02/2018
(PPWSA, Cambodia)	4 Ms. Ei Khine Mon	Assistant Engineer	12/02/2018 ~ 2	3/02/2018
and a second of	5 Ms. Thidar Su Su Khin	Sub-Assistant Engineer	12/02/2018 ~ 2	3/02/2018
Training in Japan				
Training Course	No. Name	Position	Period	
"Overall Utility	1 Ms. Aye Pa Pa Nyo	Assisttan Chief Engineer	23/01/2018 ~ 3	1/01/2018
Management" in Japan	2 Ms. May Oo Lwin	Executive Engineer	23/01/2018 ~ 3	1/01/2018
	3 Mr. Pyi Soe	Executive Engineer	23/01/2018 ~ 3	1/01/2018
	4 Ms. Khin Khin Htwe	Executive Engineer	23/01/2018 ~ 3	1/01/2018
	5 Ms. Khin Than Oo	Sub-Assistant Engineer	23/01/2018 ~ 3	1/01/2018
	6 Ms. Yamin	Sub-Assistant Engineer	23/01/2018 ~ 3	1/01/2018
	7 Ms. Khin Zin Mar Myint	Programmer	23/01/2018 ~ 3	1/01/2018
	8 Ms. Nyo Nyo Tun Kyaw	Assistant Supervisor	23/01/2018 ~ 3	1/01/2018
	9 Ms. May Thet Kyaw	Accountant 3	23/01/2018 ~ 3	1/01/2018

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0	Name of Item	Qty	Place of Installment	Date of Handover
-	Bench Top Turbidity Meter	1	Central labo (EDWS)	Dec. 27, 2016
2	Portable Turbidity Meter	5	Mini labo (Nyaunghnapin, Yagu, Hlawga, Phugyi and Gyobyu)	Dec. 27, 2016
3	Color of Water Portable Photometer	9	Central labo and mini labo	Dec. 27, 2016
4	Portable pH Meter	5	Mini labo	Dec. 27, 2016
2	Pocket Colorimeter II, Chlorine Model	1	Central labo	Dec. 27, 2016
9	Hot Plate Stirrer	-	Central labo	Dec. 27, 2016
1	Magnetic Stirrer	4	Central labo	Dec. 27, 2016
80	Stirring Bar	14	Central labo and mini labo	Dec. 27, 2016
6	Burette Stand	2	Central labo	Dec. 27, 2016
0	Set of glassware	1	Central labo	Dec. 27, 2016
11	Jar Tester	1	Central labo	Dec. 27, 2016
12	Sieve Shaker	1	Nyaunghnapin WTP	Dec. 27, 2016
3	Test Sieves	2	Nyaunghnapin WTP	Dec. 27, 2016
4	Electronic Balance	1	Nyaunghnapin WTP	Dec. 27, 2016
ŝ	Interface Level Monitor	1	Nyaunghnapin WTP	Dec. 27, 2016
9	Desiccator	1	Nyaunghnapin WTP	Dec. 27, 2016
1	Vacuum Filter Holder	3	Central labo	Dec. 27, 2016
80	Bell Jar	2	Central labo	Dec. 27, 2016
6	Vacuum Pump	1	Central labo	Dec. 27, 2016
0	Evaporation Dish	30	Central labo	Dec. 27, 2016
-	Filter Paper, 47mm dia.	2	Central labo	Dec. 27, 2016
22	Gas detector	1		Project Epuipment
33	Drying oven	1	Nyaunghnapin WTP	Mar. 28, 2018
54	Descicator	1	Nyaunghnapin WTP	Mar. 28, 2018
22	Portable flow meter UF801P	2	Nyaunghnapin WTP	Mar. 28, 2018
9	Extension cable 95m	2	Nyaunghnapin WTP	Mar. 28, 2018
10	Probe and support set SE1595	2	Nvaunchnapin WTP	Mar. 28. 2018

2 Equipment related to flow monitaring system

No. Name of Item	Qty	Place of Installment	Date of Handover
1 Fixed ultrasonic flow meter			
1–1 Flowmeter main unit (UFL-30)	21	Flow mater site (21 sites)	Procured by JICA
1-2 Transducers with 5m cable (SE044040NC)	42	Flow mater site (21 sites)	Procured by JICA
1-3 Mounting fixtures for transducers	21	Flow mater site (21 sites)	Procured by JICA
1-4 Coaxial Cable 20m 5C-2WAE	2	Flow mater site (21 sites)	Procured by JICA
1-5 Coaxial Cable 30m	4	Flow mater site (21 sites)	Procured by JICA
1-6 Coaxial Cable 40m	2	Flow mater site (21 sites)	Procured by JICA
1-7 Coaxial Cable 50m	2	Flow mater site (21 sites)	Procured by JICA
1-8 Coaxial Cable 60m	2	Flow mater site (21 sites)	Procured by JICA
1-9 Coaxial Cable 70m	2	Flow mater site (21 sites)	Procured by JICA
-10 Coaxial Cable 100m	2	Flow mater site (21 sites)	Procured by JICA
-11 Coaxial Cable 110m	2	Flow mater site (21 sites)	Procured by JICA
-12 Coaxial Cable 120m	2	Flow mater site (21 sites)	Procured by JICA
-13 Coaxial Cable 130m	4	Flow mater site (21 sites)	Procured by JICA
-14 Coaxial Cable 140m	2	Flow mater site (21 sites)	Procured by JICA
-15 Coaxial Cable 150m	4	Flow mater site (21 sites)	Procured by JICA
-16 Coaxial Cable 170m	4	Flow mater site (21 sites)	Procured by JICA
-17 Coaxial Cable 210m	2	Flow mater site (21 sites)	Procured by JICA
-18 Coaxial Cable 240m	4	Flow mater site (21 sites)	Procured by JICA
-19 Coaxial Cable 270m	2	Flow mater site (21 sites)	Procured by JICA
<ul> <li>20 Documents of Ultrasonic Flowmeter</li> </ul>	1	Flow mater site (21 sites)	Procured by JICA
-21 Coaxial Cable 300m for the existing Ultrasonic Flowmeter	-	Flow mater site (21 sites)	Procured by JICA
-22 Coaxial Cable 220m for the existing Ultrasonic Flowmeter	P	Flow mater site (21 sites)	Procured by JICA
-23 Coaxial Cable 750m	-	Flow mater site (21 sites)	Procured by JICA

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m	Water quality data analysis and Integrated Design and Operation of Water	-	HRD section	Feb. 9, 2017
4	Treatment Facilities, 2 <sup>nd</sup> Edition	-	HRD section	Feb. 9, 2017
ы	MWH's Water Treatment Principles and Design. 3 <sup>rd</sup> Edition	+	HRD section	Feb. 9, 2017
9	Water Quality & Treatment: A Handbook	+	HRD section	Feb. 9, 2017
1	AWWA Manual Series, and books			
7-1	M1 Principles of Water Rates, Fees, and Charges. sixth edition (30001-6F)	÷	HRD Section	Nov. 9, 2017
7-2	M3 Safety Management for Utilities,	-	HRD Section	Nov. 9, 2017
7-3	M29 Fundamentals of Water Utility Capital	-	HRD Section	Nov. 9, 2017
7-4	M47 Capital Project Delivery, second	-	HRD Section	Nov. 9, 2017
7-5	M7 Problem Organisms in Water.	-	HRD Section	Nov. 9, 2017
7-6	M12 Simplified Procedures for Water Examination. sixth edition (30012-6E)	÷	HRD Section	Nov. 9, 2017
7-7	M20 Water Chlorination & Chloramination Practices & Principles	÷	HRD Section	Nov. 9, 2017
7-8	M37 Operational Control of Coagulation and Filtration Processes third edition	-	HRD Section	Nov. 9, 2017
2-9	M48 Waterborne Pathogens, second		HRD Section	Nov. 9, 2017
7-10	M57 Algae: Source to Treatment (30057)	-	HRD Section	Nov. 9, 2017
11-2	M65 On-site Generation of Hypochlorite	-	HRD Section	Nov. 9, 2017
7-12	M2 Instrumentation & Control, third	-	HRD Section	Nov. 9, 2017
7-13	M6 Water Meters: Selection, Installation, Testing & Maintenance fifth odition	÷	HRD Section	Nov. 9, 2017
7-14	M11 Steel Pipe: A Guide for Design and Installation. fourth edition (30011)	-	HRD Section	Nov. 9, 2017
7-15	M22 Sizing Water Service Lines and Meters. third edition (30022-3E)	1	HRD Section	Nov. 9, 2017
7-16	M23 PVC Pipe Design and Installation, second edition (30023)	-	HRD Section	Nov. 9, 2017
7-17	M28 Rehabilitation of Water Mains, third edition (30028-3F)	-	HRD Section	Nov. 9, 2017
7-18	M32 Computer Modeling of Water Distribution Systems. third edition (30032-	÷	HRD Section	Nov. 9, 2017
7-19	M33 Flowmeters in Water Supply, second edition (30033)	-	HRD Section	Nov. 9, 2017
7-20	M36 Water Audits and Loss Control Programs. 4th edition (30036-4E)	-	HRD Section	Nov. 9, 2017
7-21	M41 Ductile-Iron Pipe and Fittings, third edition (30041)	4	HRD Section	Nov. 9, 2017
7-22	M44 Distribution Valves: Selection, Installation, Field Testing & Maintenance, Heira Adistan 2004, 200	-	HRD Section	Nov. 9, 2017
7-23	M49 Butterfly Valves: Torque, Headloss and Cavitation Analysis, second edition	-	HRD Section	Nov. 9, 2017
7-24	M51 Air-Release, Air/ Vacuum & Combination Air Valves (30051)	-	HRD Section	Nov. 9, 2017
7-25	M55 PE Pipe Design and Installation	-	HRD Section	Nov. 9, 2017
7-26	M21 Groundwater, fourth edition (30021- M50 Water Resources Planning, second	-	HRD Section	Nov. 9, 2017
7-27	edition (30050)	-	HRD Section	Nov. 9, 2017

2	I Scotch Cast	40	Flow mater site (21 sites)	Procured by JICA
N	Fierld data collection system			
5	Enclosure (cabinet)	თ	Kiosk (9 kiosks at folw meter site)	Procured by JICA
2-2	2 Remote Terminal Unit (RTU)/Model:DLM	6	Kiosk (9 kiosks at folw meter site)	Procured by JICA
N	Uninterruptible Power Supply (UPS)/Model:	თ	Kiosk (9 kiosks at folw meter site)	Procured by JICA
10	I GPRS/GSM Router/Model: RV50	6	Kiosk (9 kiosks at folw meter site)	Procured by JICA
5	Automatic Voltage Regulator (AVR)/Model:	6	Kiosk (9 kiosks at folw meter site)	Procured by JICA
2-6	Isolation Transformer (IT)/Model: TF425376	6	Kiosk (9 kiosks at folw meter site)	Procured by JICA
2	Power Supply Cables/Model: CA-1757-	23	Kiosk (9 kiosks at folw meter site)	Procured by JICA
2-8	Signal Cables/Model: CA-1757-S001-00	23	Kiosk (9 kiosks at folw meter site)	Procured by JICA
m	Central data collection system			
m	PC/Model: Precision Tower 3420	-	YCDC EDWS HQ	Procured by JICA
3-1	Monitor	-	YCDC EDWS HQ	Procured by JICA
m.	Notebook PC/Model: Latitude 5580	-	YCDC EDWS HQ	Procured by JICA
3-	Uninterruptible Power Supply (UPS)/Model:	-	YCDC EDWS HQ	Procured by JICA
3-6	Battery back/Model: SURT48XLBP	-	YCDC EDWS HQ	Procured by JICA
3-6	5 GPRS/GSM Router/Model: RV50	-	YCDC EDWS HQ	Procured by JICA
m	, Automatic Voltage Regulator (AVR)/Model: SVC-234.3	-	YCDC EDWS HQ	Procured by JICA
3-6	8 Color Laser Printer/Model: M552dn	-	YCDC EDWS HQ	Procured by JICA
3-0	1 Table	-	YCDC EDWS HQ	Procured by JICA
F	) Chair	-	YCDC EDWS HQ	Procured by JICA
20	rus and accessaries Name of Item	P40	Place of Installment	Date of Handove
-	Personal computer (desk top) + UPS	59	EDWS	Aug. 24, 2016
N	Printer (laser, A4) for local stations	49	EDWS	Aug. 24, 2016
m	Copy machine (color, A3) for training room	-	Training Room	Aug. 24, 2016
4	MS-office	59	EDWS	Aug. 24, 2016
5	Anti virus software	59	EDWS	Aug. 24, 2016
0	USB stick	49	EDWS	Aug. 24, 2016
N	Consumable (laser, A4)	49	EDWS	Aug. 24, 2016
00	Consumable (copy machine tonner, drum cartridae)	-	Training Room	Aug. 24, 2016
5	Personal computer (desktop) and UPS	5	EDWS	Feb. 20, 2017
10	Personal computer (laptop)	8	EDWS	Feb. 20, 2017
E	Printer (leasar, black & white, A4)		EDWS	Feb. 20. 2017

	LC SULWALE			
.0	Name of Item	Qty	Place of Installment	Date of Handover
-	ArcGIS software	1	NRW section	Feb. 23, 2017
N	Auto Cad 2017 LT	1	NRW section	Mar. 21, 2017

#### Referencial books; PC related -12

,	Veletericial poovs' La related			
No.	Name of Item	Qty	Place of Installment	Date of Handover
-	Microsoft Office Ward 2016	09	Computer section of EDWS	Feb. 9, 2017
2	Misrosoft Office Excel 2016	60	Computer section of EDWS	Feb. 9, 2017
m	Microsoft Office PowerPoint 2016	09	Computer section of EDWS	Feb. 9, 2017
4	Using Windows 8	09	Computer section of EDWS	Feb. 9, 2017

## 6 Referencial books; technical fields

>	Neleicient hooks' recimined tienes			
No.	Name of Item	Qty	Place of installment	Date of Handover
-	Standard Methods for the Examination of Water and Wastewater, 22 <sup>nd</sup> Edition	+	HRD section	Feb. 9, 2017
2	Guidelines for drinking-water quality, 4 <sup>th</sup> edition	۲	HRD section	Feb. 9, 2017

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List of Equipment related to NRW activities

Name of Item	Qty	Place of Installment	Date of Handove
Back Hoe	-	Yequ PS	Sep.20, 2016

No.	Name of Item	Qty Place of	of Installment	Date of Handover
-	Water Pipe Camera NH-40 and acccesories	1		Procured by JICA
2	Water Pipe Drilling Machine A2SA2-15 and	1		Procured by JICA
3	Water Leakage Survey Instrument LC-2500	1		Procured by JICA
4	Tee with Valve			
-	TN-65VS 10inch x 150mm	2		Procured by JICA
-2	TN-65VS 150mm x 75mm	2		Procured by JICA
5	Gate Valve Ductile			
5-1	Flange type 150	m		Procured by JICA
5-2	Flange type 100	÷		Procured by JICA
5-3	Flange type 75	e		Procured by JICA
6	Gate Valve			
6-1	Type for PVC 150	6		Procured by JICA
6-2	Type for PVC 100	15		Procured by JICA
6-3	Type for PVC 75	5		Procured by JICA
6-4	Type for PVC 50	m		Procured by JICA
1	Gate Valve Case			
7-1	Gate Valve Case NVKNS-15G-39LU	20		Procured by JICA
7-2	Bottom Plate A-1	20		Procured by JICA
00	Ductile Iron Deformed Pine			
8-1	Type K Flanged Socket 150	4		Procured by JICA
8-2	Tune K Flanded Socket 100	0		Procured by IICA
0 0	Tuno V Elangod Cochot 7E	2 C		Described by ICA
0-0	Type A rigitiged socket / 3	2		Frotured by JICA
8-8	Iype K Flanged Spigot 150	0		Procured by JICA
8-5	Type K Flanged Spigot 100	2		Procured by JICA
8-6	Type K Flanged Spigot 75	2		Procured by JICA
8-7	Double Flanged Pipe 150 x 300L	2		Procured by JICA
8-8	Double Flanged Pipe 150 x 400L	2		Procured by JICA
8-9	Double Flanged Pipe 100 x 400L	1.10		Procured by JICA
8-10	Double Flanged Pipe 75 x 400L	3		Procured by JICA
8-11	Double Flanged Pipe 75 x 250L	2		Procured by JICA
8-12	Double Flanged Pipe 75 x 150L	2		Procured by JICA
6	Ductile Iron Straight Pipe			
9-1	Tvpe K-1 150 x 5000L	80		Procured by JICA
6-6	Tvpe K-1 100 x 4000L	3		Procured by JICA
9-3	Type K-1 75 x 4000L	8		Procured by JICA
0	Push Ring, Rubber Ring, T-bolt			
10-1	Push Ring, Rubber Ring, T-bolt set 150	06		Procured by JICA
10.2	Push Ring, Rubber Ring, T-bolt set 100	5		Procured by JICA
10-3	Push Ring, Rubber Ring, T-bolt set 75	15	0	Procured by JICA
-	Ductile Iron Deformed Pipe			
11-1	Type K Bend 90° 150	5		Procured by JICA
11-2	Type K Bend 45° 150	10		Procured by JICA
11-3	Type K Bend 45° 100	4		Procured by JICA
11-4	Type K Bend 45° 75	12		Procured by JICA
11-5	Type K Bend 221/2° 150	8		Procured by JICA
11-6	Type K Bend 221/2° 75	10		Procured by JICA
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11-8	Type K Bend 111/4° 75	4		Procured by JICA
11-9	Type K S-shape Bend 150 x 300	4		Procured by JICA
1-10	Type K S-shape Bend 100 x 300	2		Procured by JICA
1-11	Type K S-shape Bend 75 x 300	9		Procured by JICA
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24-17	Bend 45° VP 50	6	Procured by JICA
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25	Metal Fitting for Joining Polyvinyl Chloride Pipe		
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25-2	TH-30L 100	50	Procured by JICA
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26	Polyvinyl Chloride Pipe Joint Bend	-	
26-1	Bend VK-00B 150×45°	15	Procured by JICA
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26-5	Bend VK-00B 100×11 1/4°	10	Procured by JICA
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9-97	Bend VK-UUB /5×11 1/4*	0,	Procured by JICA
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11-02	Bend VK-UUB 50 X 22 1/2"	4	Procured by JICA
11-02	Delivery Chloride Dine Joint VS Joint	t	Frocured by JICA
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27-4	VS Joint 50		Procured by IICA
28	Different Pine Joint		
28-1	SHINO Flex 150	4	Proctired by JICA
28-2	SHINO Flex 100	5	Procured by JICA
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29	Polyvinyl Chloride Pipe Joint VS Cap		
29-1	VS Cap 150	2	Procured by JICA
29-2	VS Cap 100	1	Procured by JICA
29-3	VS Cap 75	m	Procured by JICA
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30	Saddle Snap Tap		
30-1	WXD150X Size20	5	Procured by JICA
30-2	WXVS150X Size20	32	Procured by JICA
C-00			Procured by JICA
30-5	WXVS100X Size25	10	Procured by IICA
30-6	WXVS100X Size30	2 5	Procured by JICA
30-7	WXVS100X Size40	S	Procured by JICA
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30-9	WXVS75X Size25	5	Procured by JICA
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31	Socket for Tap and Stop Valve		
31-1	1SS Size20	245	Procured by JICA
31-2	1SS Size25	25	Procured by JICA
31-2	1SS Size30	5	Procured by JICA
31-4	155 Size4U	0	Procured by JICA
32	Polyethylene Pipe Metal Joint	1 250 1	Described by 110 A
1-20	105 Size20	10	Procured by JICA
33	Stop Valve Case F Size25	1 21	רוטרחובת הא זירע
22	JUD VAIVE WALL VIELES		

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12-1	Push Ring set TN-30W 150	40	Procured by JICA
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13 DI	ictile Iron Deformed Pipe		
13-1	Blank Flange 150	2	Procured by JICA
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17-2	MN 40	5	Procured by JICA
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18 Pc	lyvinyl Chloride Pipe Joint		
18-1	Fee Type-B 150×150		Procured by JICA
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1-61	/S Joint 150 X 100		Procured by JICA
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20-2	fee Type 100 x 75	- +-	Procised by IICA
21 Ra	I I ever Tvne Renair Valve 75 v 100	· c	Procised by IICA
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23 Fir	e Hydrant Case		
23-1	-ire Hydrant Case H=780	2	Procured by JICA
23-2	Ductile Iron Iid MR-1G-10L	2	Procured by JICA
24 Po	yvinyl Chloride Pipe and Joint		
24-1	Rubber Socket Pipe HI 150 x 5m	S	Procured by JICA
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41-14	TC RC25 x 20	50	Procured by IICA
41-15	TS R530 × 20	5	Procured by JICA
41-16	TS RS40 x 30	5	Procured by JICA
41-17	TS RS50 x 40	5	Procured by JICA
42	Union Joint		
42-1	WJT-GVS Size20	006	Procured by JICA
42-2	WJT-GVS Size25	30	Procured by JICA
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47	Polyethylene Pipe Tee MP-98TB Size75×75	-	Procured by JICA
48	Polyethylene Pipe Gate Valve PTC B22  p75	F	Procured by JICA
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50	Polyethylene Pipe Joint		
1-05	MP-988 Size/5 X 45*	2	Procured by JICA
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10	Er sadale with Plug φ/5 x φ∠0 Polivethylene Pine Ioint TP-30 Minute Fauret Socket	50	Procured by JICA
52	Size20	20	Procured by JICA
53	Polvethylene Pipe Joint TP-30 Socket Size20	10	Procured by JICA
54	Polyethylene Pipe Joint TP-30 Union Socket Size20	20	Procured by JICA
55	Polyethylene Pipe Joint TP-30 Socket for PVC	10	Procured by JICA
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57	Scraper for Polyethylene Pipe PE Scraper75	-	Procured by JICA
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63	Joining Fixture for Polyvinyl Chloride Pipe		
63-1	Type-100	2	Procured by JICA
63-2	Type-150	2	Procured by JICA
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54.3	Hose ws0mm×10m	4	Procured by JICA
64-4	Strainer	1 0	Droctined by ICA
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33.2	Stop Valve Case 100 x 380	310	Procured by JICA
34	Check Valve	5	Proclared by IICA
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35-1	DOWK Ni m25mm	15	Described by ICA
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5-05	PUWK L Q2Umm	30	Procured by JICA
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35-7	PQWK RT \$25mm x 20mm	10	Procured by JICA
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35-11	POWK RT 030mm x 20mm	15	Procined by IICA
35-12	POWK S m30mm	00	Produced by IICA
35-13	POWK   m40mm	00	Produced by IICA
25-14	DOMY DT MADE & JEMM	2	Brothed by ICA
35.15	multiple v multiple in the v	t, t	Produced by JICA
25.16	DOMY C MADE	15	Brothed by ICA
21 10		12	Procured by JICA
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32-10	PUWK KI QOUMM X JUMM	2	Procured by JICA
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36	Sluice Valve Opener	2	Procured by JICA
37	Polyethylene Pipe Joint		
37-1	1S Size20	45	Procured by JICA
37-2	1S Size25	20	Procured by JICA
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38	Polyethylene Pipe Joint 1VSP Size20	24	Procured by JICA
39	Polyethylene Pipe		
39-1	Double Layer Pipe 20 x 120M	8	Procured by JICA
39-2	Double Laver Pipe 25 x 30M		Procured by JICA
39-3	Double Laver Pipe 30 x 30M	- L.	Procured by JICA
39-4	Double Laver Pipe 40 x 20M		Procured by JICA
40	Polyvinyl Chloride Pipe		- in to (as much contact of a
40-1	VP13	20	Procured by JICA
40-2	VP20	150	Procured by JICA
40-2	VP25	s	Procured by JICA
41	Polyvinyl Chloride Pipe Joint		
41-1	TS S20	1200	Procured by JICA
41-2	TS S30	10	Procured by JICA
41-3	TS S40	10	Procured by JICA
41-4	TS S50	10	Procured by JICA
41-5	TS L20	1200	Procured by JICA
41-6	TS L25	20	Procured by JICA
41-7	TS L30	10	Procured by JICA
41-8	TS L40	10	Procured by JICA
41-9	TS L50	10	Procured by JICA
41-10	TS T20	50	Procured by JICA
41-11	TS T30	5	Procured by JICA
41-12	TS T40	5	Procured by JICA
41-13	TS T50	5	Procured by JICA

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66:3.1         C-50ES         5         Proto           66:3.1         C-100ES         3         2         Proto           66:5.5         C-100ES         3         2         Proto           66:5.5         C-100ES         3         2         Proto           70:1         Exchomagnetic Flourmeter         2         Proto         Proto           70:1         Enthonio G.Ster JSOpm         2         Proto         Proto           70:1         Enthonio G.Ster JSOm         2         Proto         Proto           70:1         Enthonio G.Ster JSOm         2         Proto         Proto           70:1         Enthonio G.Ster JSOm         2         Proto         Proto           70:1         Enthonio Ganes House HL-250         4         1         Proto           71:1         LEGORI         5         1         1         Proto           71:1         LEGORI         3         1         1         Proto           7:1         LEGORI         Antware Proof Case AD15-10-8 (Special         5         Proto           7:1         LEGORI         Antware Proof Case AD15-10-8 (Special         5         Proto           7:1         LEGORI <t< td=""><td>68-2 C-40ES</td><td>5</td><td>Procured by JICA</td></t<>	68-2 C-40ES	5	Procured by JICA
66.4         C-6005         Flow         Process         Proces         Process         Proces	68-3 C-50ES	5	Procured by JICA
665.5         C - TODES         Proto           70         Water Stopper for Polyvinyl Chloride Pipe VP         5         Proto           70         Electronnagnetic Flowmeter         2         Proto           70         Electronnagnetic Flowmeter         2         Proto           70:1         Ubricanti Conger         4         Proto         Proto           7:1         US051         1         1         Proto         Proto           7:1	68-4 C-80ES	ñ	Procured by JICA
39         Water Stopper for Polyvinyl Chloride Fipe VP         5         Priot           701         ErMaanDeric Flowmeter         2         Priot           701         Envalonde Exercision         2         Priot           701         Envalonde Exercision         2         Priot           703         Connecting Pipes         2         Priot           713         Unstant V-Soap 2kg         1         1         Priot           743         Use East         Proot Case AD15-10-8 (Special         5         Priot           744         Software         1         1         Priot         Priot           744         Software         3         3         Priot         Priot           744         Software         100         Priot         Priot         Priot           744         Software         100         100         Priot         Priot           744         Software         100         100         Priot         Priot <td< td=""><td>68-5 C-100ES</td><td>3</td><td>Procured by JICA</td></td<>	68-5 C-100ES	3	Procured by JICA
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0.         Electromagnetic Flowmeter           70-1         Exan Result         2         Proc           70-1         Stan Result         2         Proc           70-1         Exan Result         2         Proc           70-1         Stan Result         2         Proc           71         Ubricanty Comercing Pipes         70         2         Proc           7         Adhesive for Polyvinyl Chloride Pipe 500G         40         Proc         Proc           74-1         Usconst Jacows Hose HL-250         1         Proc         Proc           74-1         Usconst         Adhesive for Polyvinyl Chloride Pipe 500G         1         Proc         Proc           74-1         Usconst         Advector         1         Proc         Proc           74-1         Usconst         Advector         1         Proc         Proc           74-1         Usconst         Downetor Usconst         10         Proc         Proc           74-1         Usconst         Downetor Usconst         3         Proc         Proc           74-1         Usconst         Downetor Usconst         3         Proc         Proc           7         Ubricant for Ductile Iron Pipes 2kg <td>Stopper 50mm</td> <td>2</td> <td>which a painta</td>	Stopper 50mm	2	which a painta
70-1         ETMA070C Site Somm         2         Prote           70-2         Exam Result         2         Prote           70-3         Connertisent V-Soap 2kg         10         Prote           70-3         Connertisent V-Soap 2kg         10         Prote           7         Lubricant V-Soap 2kg         10         Prote           7         Putise Data Logger         7         2         Prote           7         Putise Data Logger         1         Prote         Prote           7         Putise Data Logger         1         Prote         Prote           74-1         LESOH         5         Prote         Prote           74-1         LESOH         4         Prote         Prote           74-1         LESOH         5         Prote         Prote           74-2         USB Cable         Prote         Prote         Prote           74-1         LECOH         Prote         Prote         Prote           74-2         USB Cable         Prote         Prote         Prote           74-3         USB Cable         Prote         Prote         Prote           75         Cone Rod gal L=15m Model Number8YO129         3 <td>10 Electromagnetic Flowmeter</td> <td></td> <td></td>	10 Electromagnetic Flowmeter		
70-2.         Exam Resuft         2         Proc         Proc           7.1         Lubricanty Cances Hose HL-250         40         Proc         Proc           2         Adhesive for Polyvinyl Chloride Pipe S00G         40         Proc         Proc           2         Adhesive for Polyvinyl Chloride Pipe S00G         40         Proc         Proc           3         Derining Cances Hu-250         1         Proc         Proc           74-1         LiScoli         1         Proc         Proc           74-1         LiScoli         1         Proc         Proc           74-2         USB         1         Proc         Proc           74-4         Software         1         1         Proc           7-5         Doth Model Number670129         30         Proc         Proc           7-6         Doth Model Number670129         30         Proc         Proc           7-7         Doth Model Number670129         30         Proc         Proc           7-6         Color Cone         2         Proc         Proc           7         Lubricant for Ducide Fine Joint VC joint 150         3         Proc         Proc           8         MoneeBranow	70-1 ETM3070C Size150mm	2	Procured by JICA
70.3         Connecting Pipes         Proc         Proc           1         Unbicant V. Sengel         10         Proc         Proc           2         Unbicant V. Sengel         10         Proc         Proc           3         Draining Carvos Hose HL-250         1         Proc         Proc           74-1         IRS061         30         Proc         Proc           74-1         IRS061         30         Proc         Proc           74-1         IRS061         30         Proc         Proc           75-1         700H Model Number870129         30         Proc         Proc           75-2         Cone Rod Gast AL=1.5/m Model Number87067         1         Proc         Proc           80401 SIGPT Reservorus         1         Proc         Proc         Proc           81<	70-2 Exam Result	2	Procured by JICA
1         Lubricant V. Scap 2kg         10         Proc         Proc           2         Adhesive For Polymyl Chloride Pipe 500G         40         Proc         Proc           4         Puise Data Logger         5         Proc         Proc           74-1         IRS061         5         Proc         Proc           74-1         IRS061         5         Proc         Proc           74-1         IRS061         5         Proc         Proc           74-3         USB Cable         1         Proc         Proc           74-4         Schware         1         Proc         Proc           6         Color Cone         2         Proc         Proc           7         Lubricant for Ductile Iron Pipes 2kg         3         Proc         Proc           8         Winelbarrow         2         Proc         Proc         Proc           16-2         Cone Rod Gase AD15-10-8 (Special AD15-10-8 (Spec	70-3 Connecting Pipes	2	Procured by JICA
2         Adhesive for Polyviny/ Chloride Pipe 500G         40         Proc           3         Draining Canvas Hose HL-250         1         Proc         Proc           74-1         UR5061         1         1         Proc         Proc           74-1         UR5061         1         1         Proc         Proc           74-1         UR5061         1         1         Proc         Proc           74-3         USR Cable         1         1         Proc         Proc           6         Dott and Water Proof Case AD15-10-8 (Special 5)         5         Proc         Proc           6         ToOH Model Number8Y(0129         30         Proc         Proc           6         ToOH Model Number8Y(0129         30         Proc         Proc           6         Dott Come         3         1         Proc         Proc           7         Nrehelbarrow         3         3         Proc         Proc           8         Hicatast for Ductile from Pipes 2kq         3         1         Proc           9         Forcer Core         Statistic Flowmeter UPP-20 and Small /         1         Proc           1         Forcer Core flor Electromagnetic Flowmeter UPP-20 and Small /<	1 Lubricant V-Soap 2kg	10	Procured by JICA
3         Draining Canvas Hose HL-250         1         Prior           74-1         Uts6061         5         Prior           74-2         Uts6061         5         Prior           74-1         Uts6061         5         Prior           74-2         Uts6061         1         Prior           74-3         Use Cable         1         Prior           74-4         Uts061         1         Prior           74-5         Use Cable         1         Prior           74-1         Uts061         5         Prior           74-1         Drono         Prior         Prior           75-1         TobH Model Number&10-8 (Special         30         Prior           75-1         TobH Model Number&10-9 (Case AD15-10-8 (Special         30         Prior           76-1         TobH Model Number&10-9 (Case AD15-10-8 (Special         30         Prior           76-1         Protrope Wrench         2         Proce         Proce           76-1         TobH Model Number&10-9 (Dard Small /         1         Proce           7         Exolor Cover for Electromagnetic Flowmeter UFP-20 and Small /         1         Proce           7         Iron Cover for Electromagnetic Flowme	2 Adhesive for Polyvinyl Chloride Pipe 500G	40	Procured by JICA
4         Puise Data Logger           74-1         UR5061         5         Proc           74-3         US8 Cable         1         Proc           5         Dust and Water Proof Case AD15-10-8 (Special         5         Proc           6         Color Cone         Proc         Proc           7         Lubricant for Ductile Iron Pipes 2kg         10         Proc           8         WheelB Snap Tag         30         Proc           9         Software         3         Proc           1         Polyrinyl Chloride Pipe Joint VC joint 150         3         Proc           1         Polyrinyl Chloride Pipe Joint VC joint 150         3         Proc           2         Color Core         Soft Snap Tag         3         Proc           3         Unbricant for Ductile Flowmeter UFP-20 and Snall /         1         Proc           4         Lubricant for Ductile Flowmeter UFP-20 and Snall /         1         Proc           5         Fortable Ultrasconic Flowmeter UFP-20 and Snall /         1	3 Draining Canvas Hose HL-250	-	Procured by JICA
74-1         I.R5061         5         Prior           74-2         I.R5091         1         Prior         Prior           74-4         Software         1         Prior         Prior           74-4         Lots and Water Proof Case AD15-10-8 (Special         5         Prior           74         Lots and Water Proof Case AD15-10-8 (Special         5         Prior           6         Dont Model Number8Y0129         30         Prior           76-1         TooH Model Number8Y0129         30         Prior           76-1         TooH Model Number8Y0129         30         Prior           76-1         TooH Model Number8Y1057         30         Prior           76-1         TooH Model Number8Y1057         30         Prior           7         Lubricant for Ducile Pipe Joint VC Joint 150         3         Prior           0         Saddle Snap Tap         3         Prior         Prior           1         Torque Wrench         2         7         Prior           2         Iron Cover for Electromagnetic Flowmeter UFP-20 and Small         1         Prior           2         Iron Cover for Electromagnetic Flowmeter UFP-20         1         Prior           3         Iron Cover for	4 Pulse Data Logger		
74-2         LR5091         1         Proc           74-3         USB Gable         1         Proc           74-3         USB Cable         1         Proc           74-3         USB Cable         Proc         Proc           5         Dust Softward Water Proof Case AD15-10-8 (Special         5         Proc           5         Dist Softward Water Proof Case AD15-10-8 (Special         5         Proc           6         Color Cone         Red Q34 L=1.5m         Model Number@Y0129         30         Proc           7         Lubricant for Ductile Iron Pipes 2kg         30         Proc         2         Proc           7         Lubricant for Ductile File Howmeter UFP-20         3         Proc         Proc           1         Polyvinyl Chloride Pile Electromagnetic Flowmeter Case         3         Proc           2         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           3         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           4         Polyvinyl Chloride Pile Ultrasonic Flowmeter UFP-20         1         Proc           5         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           6         Portable Ultrasonic Flowmeter UFP-20 <td>74-1 LR5061</td> <td>2</td> <td>Procured by JICA</td>	74-1 LR5061	2	Procured by JICA
74-3         USB Cable         1         Proc           74-3         USB Cable         1         5         Proc           74-4         Software         1         5         Proc           74-4         Software         1         5         Proc           76-1         700H Model NumberdY0129         30         Proc           76-1         700H Model NumberdY0129         30         Proc           76-1         700H Model NumberdY0129         30         Proc           8         Wheelbarrow         3         Proc           9         Torque Wrench         2         Proc           1         Polyding Sapt Tap         3         Proc           3         Inon Cover for Electromagnetic Flowmeter Case         3         Proc           3         Inon Cover for Electromagnetic Flowmeter Case         3         Proc           4         Large sensori set         1         Proc           4-1         For cable Ultrasonic Flowmeter UFP-20         1         Proc           5         form Lest Complant         3         Proc           6         Softer PB Straight Fipe         3         Proc           6         Softer PB Straight Fipe <td< td=""><td>74-2 LR5091</td><td></td><td>Procured by IICA</td></td<>	74-2 LR5091		Procured by IICA
[44]         Software         1         Proc           5         Dust and Water Proof Case AD15-10-8 (Special         5         Proc           6         Dust and Water Proof Case AD15-10-8 (Special         5         Proc           6         Color Cone         Rodel Number8Y0129         30         Proc           6         Fort Cone         Rod g34.1=1.5m         Model Number8Y0167         30         Proc           76-1         700H Model Number8Y0129         3         Proc         Proc           7         Soddle Snp Tap         3         Proc         Proc           8         Wheelbarrow         3         Proc         Proc           1         Polynomy Chloride Fipe Joint VC joint 150         3         Proc         Proc           2         Iron Cover for Electromagnetic Flowmeter Case         3         Proc         Proc           3         Iron Cover for Electromagnetic Flowmeter Case         3         Proc         Proc           3         Iron Cover for Electromagnetic Flowmeter Case         3         Proc         Proc           4         Portable Ultrasonic Flowmeter UFP-20         1         Proc         Proc           2         Iron Cover for Electromagnetic Flowmeter Case         3 <t< td=""><td>74-3 USB Cable</td><td>-</td><td>Procured by JICA</td></t<>	74-3 USB Cable	-	Procured by JICA
Dust and Water Proof Case AD15-10-8 (Special         5         Proof           6         Color Cond         9         Proof           7         Lubricant for Ductile Iron Pipes 2kg         30         Proof           7         Lubricant for Ductile Iron Pipes 2kg         30         Proof           8         Wheelbarrow         2         Proof           9         Wheelbarrow         3         Proof           1         Inbricant for Ductile Iron Pipes 2kg         3         Proof           2         Irongo Wrench         2         Proof           2         Iron Cover for Electromagnetic Flowmeter Case         3         Proof           2         Iron Cover for Electromagnetic Flowmeter Case         3         Proof           2         Iron Cover for Electromagnetic Flowmeter Case         3         Proof           3         Iron Cover for Electromagnetic Flowmeter Case         3         Proof           4         Larce sensor set         1         Proof           35-1         ScoPmathe Ultrasonic Flowmeter UFP-20         1         Proof           44         Larce sensor set         1         Proof           35-1         ScoPmathe Ultrasonic Flowmeter UFP-20         1         Proof	74-4 Software	-	Procured by JICA
Processed)         3         Processed)           6         Color Cone         2         Processed           6         Color Cone         30         Processed           7         Lubricant for Ductile Iron Pipes 2kg         30         Processed           8         Wheelbarrow         3         Processed         3         Processed           8         Wheelbarrow         3         Processed         3         Processed           9         Forder Care Flectronnagnetic Flowmeter Case         3         Processed         3         Processed           2         Iron Cover for Electronnagnetic Flowmeter UFP-20 and Small /         1         Processed         3         Processed           3         Iron Cover for Electronnagnetic Flowmeter UFP-20 and Small /         1         Processed         3         Processed           4         Large sensor set         1         1         Processed         3         Processed           5         SGP PB Straight Pipe         3         1         Processed         3         Processed           5         SGP PB Straight Pipe         1         1         Processed         3         Processed           5         SGP PB Straight Pipe         2         Process	E Dust and Water Proof Case AD15-10-8 (Special	L	1 - 1 - 1
6         Color Cone           6-1         700H Model Number@Y1029         30         Proce           7         100H Model Number@Y1029         30         Proce           7         Lubricant for Ductile Iron Pipes 2kg         10         Proce           8         Wheelbarrow         3         Proce         Proce           9         Torque Viernah         2         Proce         Proce           1         Polyvinyl Chloride Pipe Joint VC joint 150         3         Proce         Proce           2         Iron Cover for Electromagnetic Flowmeter UFP-20 and Small /         2         Proce         Proce           3         Iron Cover for Electromagnetic Flowmeter UFP-20         1         Proce         Proce           4         Large sensor set         1         1         Proce           4         Large sensor set         1         1         Proce           5         SGPPB Straight Pipe         3         1         Proce           6         Check Valee Fisce         3         3         1         Proce           6         SGPPB Straight Pipe         3         3         1         Proce           6         SGORML Let A0m         1         1 <td< td=""><td>processed)</td><td>p</td><td>Frocured by JICA</td></td<>	processed)	p	Frocured by JICA
Res         Note	6 Color Cone		
(6-2)         Cone Rod         q34 L=1.5m         Model Number8Y1067         30         Proce           7         Lubricant for Ductile Iron Pipes 2Rq         10         Proce         Proce           8         Mreelbarron         3         Proce         Proce           1         Lubricant for Ductile Iron Pipes 2Rq         3         Proce         Proce           1         Polyvinyl Chloride Pipe Joint VC Joint 150         3         Proce         Proce           2         Iron Cover for Electronagnetic Flowmeter Case         3         Proce         Proce           3         Iron Cover for Electronagnetic Flowmeter Case         3         Proce         Proce           4         Large sensor set         1         Proce         Proce           44-1         Fortable Ultrasonic Flowmeter Case         3         Proce         Proce           44-2         Silicon Gresse Couplant         1         Proce         Proce           45-1         Proce         3         1         Proce         Proce           45-1         Silicon Gresse Couplant         1         1         Proce         Proce           45-1         ScoPase Estight Pipe         21         1         Proce         Proce <tr< td=""><td>76-1 700H Model Number8Y0129</td><td>30</td><td>Procured by JICA</td></tr<>	76-1 700H Model Number8Y0129	30	Procured by JICA
7         Lubricant for Ductile Iron Pipes 2kg         10         Proce           8         Mheelbarrow         3         Proce         Proce           0         5addre Snap Tagh         3         Proce         Proce           1         Polyvinyl Chloride Pipe Joint VC joint 150         3         Proce         Proce           2         Iron Cover for Electromagnetic Flowmeter Gase         3         Proce         Proce           3         Iron Cover for Electromagnetic Flowmeter UFP-20 and Small /         1         Proce         Proce           4         Large sensor set         3         Proce         Proce         Proce           4-1         Sticen Grease Couplant         3         1         Proce         Proce           5         SGP PB Straight Pipe         3         1         Proce         Proce           55-1         Q25mm, L=4.0m         7         1         Proce         Proce           55-3         g30mm, L=4.0m         7         1         Proce         Proce           55-4         p50mm, L=4.0m         7         1         Proce         Proce           55-4         p50mm, L=4.0m         7         1         Proce         Proce           55	76-2 Cone Rod @34 L=1.5m Model Number8Y1067	30	Procured by JICA
8         Wheelbarrow         3         Procession           0         Torque Whendh         2         Procession         Procession           1         Polyding Snapt Exponentier (Snapt Ex	7 Lubricant for Ductile Iron Pipes 2kg	10	Procured by JICA
9         Torque Wrench         2         Proc           1         Ployiny Chorde Ploid VC joint 150         3         Proc           2         I polyviny Chorde Ploid VC joint 150         3         Proc           3         Iron Cover for Incide Ploye Joint VC joint 150         3         Proc           3         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           4         Large sensor set         1         Proc           4-1         Large sensor set         1         Proc           3-2         Snall sensor set         1         Proc           4-3         Large sensor set         1         Proc           3-3         930mm, L=4.0m         7         Proc           3-5         950mm, L=4.0m         7         Proc           3-6         Check Valve F Sise20         310         Proc           3-7         Resin Pipe Detector NPL-100 and accessories         1         Proc	8 Wheelbarrow	3	Procured by JICA
0         Saddle Snap Tap         Proc         Proc           1         Polyvinyl Chloride Pipe Joint VC joint 150         3         Proc           2         Iron Cover for Electromagnetic Flowmetter Case         3         Proc           3         Iron Cover for Electromagnetic Flowmetter Case         3         Proc           4         Larce sensor set         1         Proc           44.1         Fortable Ultrasonic Flowmeter UFP-20 and Small / Larce sensor set         1         Proc           44.3         Larce sensor set         1         Proc         Proc           44.3         Silicon Grease Couplant         3         Proc         Proc           45.1         Portable Ultrasonic Flowmeter UFP-20         1         Proc         Proc           45.5         SGPHB Straight Pipe         3         Proc         Proc           55.1         USDmm         1         Proc         Proc           55.2         pSGPmS straight Pipe         1         Proc         Proc           55.5         pSfmm         1.4.0m         7         Proc         Proc           55.5         pSfmm         1.4.0m         7         Proc         Proc           55.5         pSfmm         1.4.0m<	9 Torque Wrench	2	Procured by JICA
I         Polyvinyl Chloride Pipe Joint VC joint 150         3         Proc           2         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           3         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           4         Iron Cover for Electromagnetic Flowmeter Case         3         Proc           4         Large sensor set         1         Proc           44.1         Portable Ultrasonic Flowmeter UFP-20         1         Proc           54.2         Small sensor set         1         Proc           64.3         Silicon Grease Couplant         3         Proc           55.4         Softmuck L=4.0m         7         Proc           65.3         g30mm, L=4.0m         7         Proc           65.4         g30mm, L=4.0m         7         Proc           65.5         g50mm, L=4.0m         7         Proc           71.4         Silicon Grease Couplant         7         Proc           73.4         g30mm, L=4.0m         7         Proc           73.5         g50mm, L=4.0m         7         Proc           73.4         g30mm, L=4.0m         7         Proc           73.5         g50mm, L=4.0m         7	0 Saddle Snap Tap	4	Produred by JICA
2         Iron Cover for Electromagnetic Flowmeter Case         3         Proo           3         Iron Cover for Electromagnetic Flowmeter UFP-20 and Small /         Proo           44         Denois Flowmeter UFP-20         1         Proo           41.1         Portable Ultrasonic Flowmeter UFP-20         1         Proo           43.1         Fortable Ultrasonic Flowmeter UFP-20         1         Proo           43.1         Portable Ultrasonic Flowmeter UFP-20         1         Proo           43.2         Small sensor set         1         Proo           43.3         Silcon Grease Couplant         3         Proo           5         SGP-PB Straight Pipe         7         Proo           5.3         y50mm, L=4.0m         7         Proo           5.3         y50mm, L=4.0m         21         Proo           5.4         y40mm, L=4.0m         21         Proo           5.5         y50mm, L=4.0m         7         Proo           5.4         y40mm, L=4.0m         10         Proo           5.5         y50mm, L=4.0m         10         Proo           5.5         y50mm, L=4.0m         10         Proo           5.5         y50mm, L=4.0m         10 <td< td=""><td>1 Polyvinyl Chloride Pipe Joint VC joint 150</td><td>m</td><td>Procured by JICA</td></td<>	1 Polyvinyl Chloride Pipe Joint VC joint 150	m	Procured by JICA
B         Iron Cover for Electromagnetic Flowmeter Case         3         Processors set         Processors set           At-1         Portable Ultrasonic Flowmeter UFP-20         1         1         Processors set         Processors set           At-1         Portable Ultrasonic Flowmeter UFP-20         1         1         Processors set         Processors set           At-2         Small sensor set         1         1         Processors set         Processors set           At-3         Large sensor set         1         1         Processors set         Processor set           At-3         Large sensor set         1         1         Processor set         Processor set           At-3         SGP-Pathon         1-4.0m         1         Processor set         Processor set           At-4         Max         L-4.0m         1         Processor set         Processor set           At-4         Max         At-4.0m         1	2 Iron Cover for Electromagnetic Flowmeter Case	e	Procured by JICA
4         Portable Ultrasonic Flowmeter UFP-20         and Small /           44-1         Large sensor set         1         Proceeding Litrasonic Flowmeter UFP-20           44-1         Fortable Ultrasonic Flowmeter UFP-20         1         Proceeding Litrasonic Flowmeter UFP-20           44-1         Fortable Ultrasonic Flowmeter UFP-20         1         Proceeding Litrasonic Flowmeter UFP-20           44-1         Fortable Ultrasonic Flowmeter UFP-20         1         Proceeding Litrasonic Flowmeter UFP-20           44-1         Silicon Grease Couplant         3         1         Proceeding Litrasonic Flowmeter UFP-20           55-1         g26Pmb Litrasonic Flowmeter UFP-20         14         Proceeding Litrasonic Flowmeter UFP-20         Proceeding Litrasonic Flowmeter UFP-20           55-1         g26mm, L=4.0m         7         Proceeding Flow         Proceeding Flow           55-1         g26mm, L=4.0m         1         Proceeding Flow         Proceeding Flow           55-1         g20mm, L=4.0m         10         10         Proceeding Flow           55-1         g20mm, L=4.0m         11         Proceeding Flow         Proceeding Flow           55-1         g20mm, L=4.0m         1         10         Proceeding Flow           5         g50mm, L=4.0m         1         10	3 Iron Cover for Electromagnetic Flowmeter Case	3	Procured by JICA
Larce sensor set         1         Processor set           34-1         Portable Ultrasonic Flowmeter UFP-20         1         Processor set           34-3         Large sensor set         1         Processor set           34-4         Silicon Grease Couplant         3         Processor set           35-1         Large sensor set         1         Processor set           35-1         upstom L = 4.0m         7         Processor set           35-1         upstom L = 4.0m         7         Processor set           35-3         upstom L = 4.0m         7         Processor set           35-4         upstom L = 4.0m         7         Processor set           35-5         upstom L = 4.0m         7         Processor set           35-4         upstom L = 4.0m         7         Processor set           35-5         upstom L = 4.0m         7         Processor set           35-6         upstom L = 4.0m         7         Processor set           37-1         NPL-100         1	Portable Ultrasonic Flowmeter UFP-20 and Small /		
94-1         Portable Ultrasonic Flowmeter UFP-20         1         Processes           94-3         Small sensor set         1         1         Processes           94-3         Silicon Grease Couplant         3         Processes         Processes           54-4         Silicon Grease Couplant         3         Processes         Processes           55         SGP-PB Straight Pipe         7         Processes         Processes           55-3         ψ30mm, L=4.0m         7         Processes         Processes           55-3         ψ30mm, L=4.0m         7         Processes         Processes           55-3         ψ30mm, L=4.0m         7         Processes         Processes           55-4         φ40mm, L=4.0m         7         Processes         Processes           55-4         ware set to a	Large sensor set		
34-2     Small sensor set     1     Proc       34-3     Large sensor set     1     Proc       35-1     Large sensor set     1     Proc       55     SeP-PB Straight Pipe     14     Proc       55-1     up20mm, L=4.0m     7     Proc       55-2     up20mm, L=4.0m     10     Proc       55-3     up20mm, L=4.0m     10     Proc       55-4     up20mm, L=4.0m     10     Proc       55-5     up20mm, L=4.0m     10     Proc       56-5     up20mm, L=4.0m     10     Proc       57-1     NPL-100 and accessories     1     Proc       57-1     NPL-100 and accessories     1     Proc       57-1     NPL-100     1     Proc       57-1     NPL-100     1     Proc       57-1     NPL-100     1     Proc       57-2     Adapter     1     1     Proc    57-3     Exam result     1     1     Proc       57-4     NPL     Proc     1     Proc       57-5     Adapter     1     1     Proc       57-5     Adapter     1     1     Proc       57-5     Adapter     2     1       58-6	34-1 Portable Ultrasonic Flowmeter UFP-20	1.1.	Procured by JICA
84-3     Large sensor set     1     Proc       84-3     Large sensor set     1     Proc       85-4     ScSP-BS failight Breace     3     Proc       85-1     ψ20mm, L=4.0m     7     Proc       85-3     g50mm, L=4.0m     7     Proc       85-4     g50mm, L=4.0m     10     Proc       85-5     g50mm, L=4.0m     310     Proc       85-5     g50mm, L=4.0m     310     Proc       85-5     g50mm, L=4.0m     1     Proc       85-6     Check Valwe F Sise20     310     Proc       85-7     Abbin     1     Proc       7     Resin Pipe Detector NPL-100 and accessories     1     Proc       7     AnPL-100     1     Proc       7     Abbin     2     1     Proc       7     Abbin	34-2 Small sensor set	-	Procured by JICA
34.4     Silicon Grease Couplant     3     Image: Complement       35.1     926mm, L=4.0m     7     Proc       35.2     926mm, L=4.0m     7     Proc       35.3     930mm, L=4.0m     21     Proc       35.5     950mm, L=4.0m     10     Proc       35.5     950mm, L=4.0m     7     Proc       35.5     950mm, L=4.0m     7     Proc       35.5     950mm, L=4.0m     7     Proc       35.5     950mm, L=4.0m     5     Proc       35.5     950mm, L=4.0m     5     Proc       35.5     950mm, L=4.0m     10     Proc       35.5     950mm, L=4.0m     1     Proc       35.5     950mm, L=4.0m     1     Proc       35.1     Resin Pipe Detector NPL-100 and accessories     1     Proc       37.2     Resin Pipe Detector     1     Proc       37.3     Exam result     1     Proc       37.4     Metal Detector F-90M     1     Proc       39.1     Model HM1812     200M     2     Proc       39.2     Conversion Plug     Type-B     2     Proc       39.2     Model HM1812     29410mm     6     Proc       30.3     Parst Number A-21335	34-3 Large sensor set	F	Procured by JICA
S SGP-PB Straight Pipe           5- SGP-PB Straight Pipe           5- Sold math         1-4.0m         7           65-1         q20mm, L=4.0m         7         Processon           65-3         q30mm, L=4.0m         7         Processon           65-4         q40mm, L=4.0m         7         Processon           65-5         q50mm, L=4.0m         7         Processon           65-5         q50mm, L=4.0m         7         Processon           70-7         Resin Pipe Detector NPL-100 and accessories         10         Processon           71< NPL-100         1         Processories         1         Processon           73-1< NPL-100         1         1         Processon           73-1< NPL-100         1         1         Processon           73-1< NPL-100         1         1         Processon           73-1< Statemetal         1         1         Processon           73-1< State Nume         1         1         Processon           73-1< State Nume         1         1         Processon           73-1< State Nume         1         1         Processon           73-1< Nume         1         1         Processon           7	34-4 Silicon Grease Couplant	3	Procured by JICA
Bit         Discriment         L=4.0m         Tence         Proce           55-1         w26mm, L=4.0m         14         Proce           55-3         w26mm, L=4.0m         21         Proce           55-4         w26mm, L=4.0m         10         Proce           55-5         w50mm, L=4.0m         10         Proce           55-5         w50mm, L=4.0m         10         Proce           55-5         w50mm, L=4.0m         10         Proce           51-6         Proce         310         Proce           7         Resin Pipe Detector NPL-100 and accessories         1         Proce           71-1         NPL-100         1         1         Proce           73-1         NPL-100         1         1         Proce           73-2         Adapter         1         1         Proce           73-3         Exam result         1         1         Proce           73-4         Metal Detector F-90M         1         1         Proce           8         Metal Detector F-90M         1         1         Proce           9-1         Model Huflari         Type-8         2         Proce           00-1 <t< td=""><td>5 SGP-PB Straight Pipe</td><td></td><td>41 - 102</td></t<>	5 SGP-PB Straight Pipe		41 - 102
53-3         025mm, L=4.0m         7         Proc           55-4         930mm, L=4.0m         21         Proc           55-4         950mm, L=4.0m         21         Proc           55-5         950mm, L=4.0m         5         Proc           55-5         950mm, L=4.0m         5         Proc           55-5         950mm, L=4.0m         5         Proc           57-1         NP1-100         1         Proc           71-1         NP1-100         1         Proc           8         Metal Detector F-90M         1         Proc           91         Model Pater Leakage Detector<	55-1 φ20mm、L=4.0m	14	Procured by JICA
55-3     g30mm, L=4.0m     21     Proc       55-4     g40mm, L=4.0m     10     Proc       55     g50mm, L=4.0m     5     Proc       56     Check Valve F Size20     310     Proc       57     Resin Pipe Detector NPL-100 and accessories     1     Proc       77     Ansin Pipe Detector NPL-100 and accessories     1     Proc       77     Ansin Pipe Detector NPL-100 and accessories     1     Proc       73     Exam result     1     Proc       73     Exam result     1     Proc       8     Metal Detector F-90M     1     Proc       99-1     Model POR     2     Proc       99-2     Conversion Plug Type-B     2     Proc       01-1     Model HM1812 (200y)     2     2       02-1     Model HM1812 (200y)     2     Proc       02-1     Model HM1812 (200y)     2     Proc       03-1     Park Number A-21315     28x410mm     6     Proc	35-2	7	Procured by JICA
5-5         g90mm, L=4.0m         Tho         Proc           5-5         4950mm, L=4.0m         310         Proc           7         Check Valee Fiscar         310         Proc           7         Resin Pipe Detector NPL-100 and accessories         310         Proc           7         Resin Pipe Detector NPL-100 and accessories         1         Proc           7-1         NBL-100         1         Proc           7-2         Adapter         1         Proc           7-3         Exam result         1         Proc           7-3         Exam result         1         Proc           8         Metal Detector F-90M         1         Proc           9         Resin Pipe Water Leakage Detector         Proc         Proc           9-1         Model Nug Type-B         2         Proc           0:1         Model Nug Type-B         2         Proc           0:1         Model Mumber A.21315         28.410mm         6         Proc	35-3 \$30mm, L=4.0m	21	Procured by JICA
35-9     95/0mm, L=4.0m     5     Proc       5     Check Valve F Sise20     310     Proc       77-1     NPL-100     The second accessories     1     Proc       77-1     NPL-100     The second accessories     1     Proc       77-2     Adapter     1     Proc     Proc       77-3     Exam result     1     Proc       73-4     Breach Detector F-90M     1     Proc       9     Hould Da0S     1     Proc       99-1     Model D30S     1     Proc       99-2     Conversion Plug <type-b< td="">     2     Proc       90-1     Model D30S     2     1     Proc       91-2     Conversion Plug<type-b< td="">     2     Proc       92-3     Conversion Plug<type-b< td="">     2     Proc       93-4     Model D30S     2     2     Proc       93-3     Patrix Number<a.21315< td="">     29x410mm     6     Proc</a.21315<></type-b<></type-b<></type-b<>	35-4 φ40mm, L=4.0m	10	Procured by JICA
5         Check Value F Sise 20         310         Proc           71-1         NPL-100         1         Proc           71-1         NPL-100         1         Proc           71-1         NPL-100         1         Proc           71-3         Exam result         1         Proc           71-3         Exam result         1         Proc           8         Metal Detector F-90M         1         Proc           91-1         Model D305         1         Proc           92-2         Conversion Plug Type-B         2         Proc           01         Model D305         2         Proc           02-3         Patric Number A-21315         294410mm         6         Proc	55-5 φ50mm, L=4.0m	5	Procured by JICA
Netsin Pipe Detector NPL-100 and accessories         1         Proc           71         NPL-100         1         Proc           71-2         Adplet         1         Proc           71-3         Exam result         1         Proc           8         Metal Detector F-90M         1         Proc           9         Metal Detector F-90M         1         Proc           99-1         Model POID         1         Proc           99-1         Model POID         2         Proc           91-1         Model HMI812         200V)         2         Proc           0-1         Model HMI812         29410mm         6         Proc           0-3         Parts Number A-21315         284410mm         6         Proc	Check Valve F Sise20	310	Procured by JICA
Troom         Troom <th< td=""><td>/ Kesin Pipe Detector NPL-100 and accessories</td><td></td><td>1</td></th<>	/ Kesin Pipe Detector NPL-100 and accessories		1
37-2         Adapter         1         Proc           37-3         Exam result         1         Proc           38-1         Exam result         1         Proc           9         Metal Detector F-90M         1         Proc           9-1         Model D305         1         Proc           92-2         Conversion Plug Type-B         2         Proc           0-1         Hammer Drill         2         Proc           0-1         Hammer A.21319         29x410mm         4         Proc           00-2         Parts Number A.21375         28x410mm         6         Proc	0/-1 INPL-100		Procured by JICA
Orthogeneration         Image	27.2 Evam month		Procured by JICA
Immediate Detector         Immediation         Processor           99-1         Model D305         1         Processor         Processor           99-2         Conversion Plug         Type-B         Processor         Processor         Processor           99-1         Model D305         1         Processor         1         Processor           99-2         Conversion Plug         Type-B         2         Processor         Processor           00-1         Model M1812         200V)         2         Processor         Processor           00-2         Parts Number         A-21315         28x410mm         6         Processor			Procured by JICA
Model 1305         Tension Plug         Type-B         Procession Plug         Procession Plug         Type-A         Procession Plug         Plug	di Recin Dine Water Leakane Datertor		Libraried by JICA
39-2         Conversion Plug         Type-B         2         Procession           0         Hammer Drill         2         Procession         Procession           0-1         Model HM1812         200V)         2         Procession           00-1         Model HM1812         2130V)         2         Procession           00-2         Parts Number         A-21375         28x410mm         6         Procession	89-1 Model D305	1	Procined by IICA
O         Hammer Drill         Parts	39-2 Conversion Pline Type-R		Procurad by IICA
30-1         Model HM1812 (200V)         2         Proc           30-2         Parts Number         A-21319         29×410mm         4         Proc           30-3         Parts Number         A-21375         28×410mm         6         Proc	0 Hammer Drill		which a painter i
00-2 Parts Number A.21319 29×410mm 4 Proc 00-3 Parts Number A.21375 28×410mm 6 Proc	1 (VOUC) (2000) 100		Droctired by IICA
30-3 Parts Number A-21375 28x410mm 6 Proc	30.2 Barte Nimber A.21310 20x410mm	1	Drocured by IICA
	20-2 Fats Number A-21313 23×410000	t u	Procured by IICA
an A Blue WEBADO			Product by JICA
	A Deserved to the second secon	2	Procured by JICA
		1411	LIOCUICO DV JICA

2	Plate Compactor	1.1	Procured by JICA
6	Concrete Cutter and accessories		
93-1	Concrete cutter MCD-218CEH	1	Procured by JICA
93-2	18MW-RAC	3	Procured by JICA
4	Generator EF5500iSDE	1 1	Procured by JICA
9	Ductile Iron Deformed Pipe		
96-1	Type-K Flanged Socket 10k RF 150	2	Procured by JICA
96-2	Type-K Flanged Spigot 10k RF 150	2	Procured by JICA

1         Saddle Snap tap           1-1         Saddle Snap Tap 75x21           1-2         Saddle Snap Tap 100x31           1-3         Saddle Snap Tap 100x31           1-4         Saddle Snap Tap 100x31           1-5         Saddle Snap Tap 100x31           2         Joint for Polyethylene F           2-1         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-4         Joint for Polyethylene F				
1-1         Saddle Snap Tap 75x2L           1-2         Saddle Snap Tap 100x;           1-3         Saddle Snap Tap 100x;           1-4         Saddle Snap Tap 100x;           1-5         Saddle Snap Tap 100x;           2         Joint for Polyethylene P           2-1         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-4         Joint for Polyethylene F				
1-2         Saddle Snap Tap 100x;           1-3         Saddle Snap Tap 100x;           1-4         Saddle Snap Tap 100x;           1-4         Saddle Snap Tap 150x;           1-5         Saddle Snap Tap 150x;           2-1         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-4         Joint for Polyethylene F		5		Procured by JICA
1-3     Saddle Snap Tap 100×:       1-4     Saddle Snap Tap 100×:       1-5     Saddle Snap Tap 10×:       1-5     Saddle Snap Tap 10×:       2-1     Joint for Polyethylene F       2-1     Joint for Polyethylene F       2-2     Joint for Polyethylene F       2-3     Joint for Polyethylene F       2-4     Joint for Polyethylene F	20	20		Procured by JICA
1-4         Saddle Snap Tap 100x           1-5         Saddle Snap Tap 150x           2         Joint for Polyethylene F           2-1         Joint for Polyethylene F           2-2         Joint for Polyethylene F           2-3         Joint for Polyethylene F	25	10		Procured by JICA
1-5         Saddle Snap Tap 150×1           2         Joint for Polyethylene F           2-1         Joint for Polyethylene F           2-2         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-3         Joint for Polyethylene F	40	2		Procured by JICA
2         Joint for Polyethylene P           2-1         Joint for Polyethylene F           2-2         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-4         Joint for Polyethylene F	50	2	1	Procured by JICA
2-1         Joint for Polyethylene F           2-2         Joint for Polyethylene F           2-3         Joint for Polyethylene F           2-4         Joint for Polyethylene F           2-4         Joint for Polyethylene F	ipe			
2-2 Joint for Polyethylene F 2-3 Joint for Polyethylene F 2-4 Joint for Polyethylene F	Pipe Socketp20mm	10		Procured by JICA
2-3 Joint for Polyethylene F 2-4 Joint for Polyethylene F	Pipe Socketp40mm	5		Procured by JICA
2-4 Joint for Polyethylene F	Pipe elbowp20mm	10		Procured by JICA
7 El loint for Dolucthidon 1	Pipe elbowp25mm	10		Procured by JICA
2-2 JUILLIN FUNCTION	Pipe elbowp40mm	4		Procured by JICA
2-6 Joint for Polyethylene F	Pipe To20mm×o20mm	2		Procured by JICA
2-7 Joint for Polyethylene F	Pipe T@25mm×@25mm	2		Procured by JICA
2-8 Joint for Polyethylene F	Pipe To40mm×o40mm	2		Procured by JICA
2-9 Joint for Polyethylene F	Pipe Pipe end @20mm	5		Procured by JICA
2-10 Joint for Polyethylene F	Pipe Pipe endφ25mm	5		Procured by JICA
2-11 Joint for Polyethylene F	Pipe GP@20mm	15		Procured by JICA
2-12 Joint for Polyethylene F	Pipe GPp25mm	5		Procured by JICA
2-13 Joint for Polyethylene F	Pipe GPp40mm	3		Procured by JICA
1-14 Joint for Polyethylene F	Pipe GP¢50mm	2		Procured by JICA
2-15 Joint for Polyethylene F	Pipe VPp40mm	ŝ		Procured by JICA
2-16 Joint for Polyethylene F	Pipe Tap Socket@20mm	20		Procured by JICA
2-17 Joint for Polyethylene F	Pipe Tap Socket p25mm	20		Procured by JICA
2-18 Joint for Polyethylene F	Pipe Tap Socket@40mm	2		Procured by JICA
1-19 Joint for Polyethylene F	Pipe Tap Socket 950mm	2		Procured by JICA
Snap Tap for Polyethylen	e Pipe \$100mm×\$20mm	30		Procured by JICA
EF Saddle with plug S2A		10		Procured by JICA
Snap Tap for Polyvinyl (	Chloride Pipe			
5-1 Snap Tap @150mm×@5	S0mm	1		Procured by JICA
5-2 Snap Tap	0mm	30		Procured by JICA
Meter Union for Galvan	ized Steel Pipe			
6-1 Meter Union @20mm		30		Procured by JICA
6-2 Meter Union @25mm		5		Procured by JICA
Union Joint for Steel Pi	be			1. 1.
7-1 Union Joint (\$20mm		20		Procured by JICA
7-2 Union Joint (\$25mm		20		Procured by JICA
7-3 Union joint 040mm		5		Procured by JICA
Ball Tap @25mm		1		Procured by JICA
Generator and accessor	ies			
9-1 Generator EF5500iSDE		-	1	Procured by JICA
9-2 Generator Service man	ual book	1		Procured by JICA
9-3 Generator Parts catalog	g book	L		Procured by JICA
0 Lever Block LB010		2		Procured by JICA
1 PVC Pipe Insertion Machi	ne PIM200-R	L		Procured by JICA
2 Pipe IS-50AH		1		Procured by JICA
3 Ductile Iron Straight Pip	0e			
13-1 Straight Pipe @150mm	L5000mm	8		Procured by JICA

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20-3	Special Ring $\phi75mm$	10 Pr	rocured by JICA
21	Water Leakage Protection Hardware \$100mm	1 Pr	rocured by JICA
22	Water Leakage Repair Hardware		
22-1	Water Leakage Repare Hardware L255mm	1 Pr	rocured by JICA
22-2	Water Leakage Repare Hardware L157mm	1   Pr	rocured by JICA
23	Cap for Tap and Stop Valve		
23-1	Cap for Tap and Stop Valve @20mm	20 Pr	rocured by JICA
23-2	Can for Tan and Ston Valve m25mm	20 Pr	rocured by IICA
23-3	Can for Tan and Ston Valve m40mm	2 Pr	rocured by IICA
23-4	Cap for Tap and Stop Valve @50mm	2 Pr	rocured hy JICA
24	Gate Valve and Case		
24-1	Gate Valve @150mm	6   Pr	rocured by JICA
24-2	Gate Valve w100mm	18 Pr	rocured by JICA
24-3	Gate Valve ro75mm	Per Per	nonired by IICA
V VC	Gate Valve Case hody	04	rocured by IICA
34 6	Cate Valve Case Douy		pound by ICA
36	Lichricost Oba		Pocured by IICA
26	Polyathylana Straicht Pina a100mm v1 5m	10 00	notited by IICA
27	Polyathylene Two-laver Pine		included by since
27-1	Polyethylene Two-laver Pine m20mm x1120m	1   Pr	notired hv IICA
C-1C	Dolyothylene Two-layer Pipe #201117212011	- Pa	rocitred by IICA
27-3	Polyethylene Two-laver Pipe 040mm×L30m	3 Br	rocured by JICA
27-4	Polvethvlene Two-laver Pipe @50mm×L20m	1 Pr	rocured by JICA
28	Bend for Polyethylene Pipe		
28-1	Bend for Polyethylene Pipe @100mm×90°	4 Pr	rocured by JICA
28-2	Bend for Polyethylene Pipe @100mm×45°	12 Pr	rocured by JICA
29	Joint for Polyethylene Pipe		The second side
29-1	Joint for Polyethylene Pipe &100mm×L160mm	10 Pr	rocured by JICA
29-2	Joint for Polyethylene Pipe @100mm	2 Pr	rocured by JICA
30	Valve for Polyethylene Pipe	3 Pn	rocured by JICA
31	Polyvynil Chloride Pipe		
31-1	Polyvinyl Chloride Straight Pipe (1) @150mm×L500	6 Pr	rocured by JICA
31-2	Polyvinyl Chloride Straight Pipe (2) φ100mm×L500	15 Pr	rocured by JICA
31-3	Polyvinyl Chloride Pipe (1) \$20mm×L4000mm	20 Pr	rocured by JICA
31-4	Polyvinyl Chloride Pipe (2) \$25mm×L4000mm	20 Pr	rocured by JICA
31-5	Polyvinyl Chloride Pipe (3) @40mm×L4000mm	20 Pr	rocured by JICA
9-15	Polyvinyl Chloride Short Pipe(1) @150mm×L300ml	4 Ph	rocured by JICA
31-1	Polyvinyl Chloride Short Pipe(2) @100mm×L300mi	24 Pr	rocured by JICA
2-12	Polyvinyi Unioride Snort Pipe (3) @150mm×L260mm		rocured by JICA
2-15 CC	Poisvingi Chioride Short Pipe (4) (0100000 × 220000)		ocured by JICA
20-1	Band for Polyniny Chloride Dine role	2   Dr	Contrad hy IICA
32-2	Band for Polyvinyl Chloride Pine w100mm x45°	A C	rocured by IICA
33	Joint for Polyvinyl Chloride Pipe		
33-1	VK-00TF @150mm×@100mm	2 Pr	rocured by JICA
33-2	VK-00TF @100mm×@100mm	1 Pr	rocured by JICA
33-3	VK-00TB @150mm×@100mm	1 Pn	rocured by JICA
33-4	VK-00TB @100mm×@100mm	1 Pr	rocured by JICA
33-5	VK-00VS @150mm	4 Pr	rocured by JICA
33-6	VK-00VS @100mm	Pr Pr	rocured by JICA
33-7	VK-00VS @150mm×@100mm	1 Pr	rocured by JICA
33-8	VK-00VS @100mm×@75mm	1 Pr	rocured by JICA
33-9	VK-00B @150mm×90°	2 Pr	rocured by JICA
33-10	VK-008 @150mm×45°	4 br	rocured by JICA
11-55	VK-008 @100mm×90°	2	rocured by JICA
21-55	VK-00B @100mm×45*		rocured by JICA
33-14	VK-UUB (0100000000000000000000000000000000000	50 Pr	rocured by IICA
33-15	VPSocket @25mm	20 Pr	rocured by JICA
	VE300000 4000000	I I	

0.01	Ctraight Bing (0100mm 14000mm	75	Descrined by IICA
13-3	Straight Pipe @75mm L4000mm	10	Procured by JICA
14	Ductile Iron Short Pipe		
14-1	Short Pipe 1¢150mm	4	Procured by JICA
14-2	Short Pipe 1@100mm	18	Procured by JICA
14-3	Short Pipe 1@75mm	4	Procured by JICA
14-4	Short Pipe 2 @150mm	4	Procured by JICA
14-5	Short Pipe 2 @100mm	13	Procured by JICA
14-6	Short Pipe 2 @75mm	4	Procured by JICA
14-7	Short Pipe @150mm L400mm	4	Procured by JICA
14-8	Short Pipe @100mm L400mm	7	Procured by JICA
14-9	Short Pipe \$75mm L300mm	2	Procured by JICA
14-10	Short Pipe \$75mm L200mm	2	Procured by JICA
14-11	Short Pipe @150mm L100mm	2	Procured by JICA
15	Ductile Iron Deformed Pipe		
15-1	Deformed Pipe	3	Procured by JICA
15-2	Deformed Pipe	10	Procured by JICA
15-3	Deformed Pipe  \$\phi75mm\$	4	Procured by JICA
15-4	Deformed Pipe @150mm×@150mm	1	Procured by JICA
15-5	Deformed Pipe T \u00e9150mm×\u00e9100mm	1	Procured by JICA
15-6	Deformed Pipe T @100mm×@100mm	3	Procured by JICA
15-7	Deformed Pipe T @100mm×@75mm	3	Procured by JICA
15-8	Deformed Pipe Cross	1	Procured by JICA
15-9	Deformed Pipe T with flange @150mm×@100mm	2	Procured by JICA
15-10	Deformed Pipe T with flange \$100mm × \$100mm	2	Procured by JICA
15-11	Deformed Pipe T with flange @100mm×@75mm	2	Procured by JICA
15-12	Deformed Pipe @150mm×@75mm	3	Procured by JICA
15-13	Deformed Pipe 90° \$150mm	4	Procured by JICA
15-14	Deformed Pipe 90° p100mm	4	Procured by JICA
15-15	Deformed Pipe 90°@75mm	4	Procured by JICA
15-16	Deformed Pipe 45°@150mm	9	Procured by JICA
15-17	Deformed Pipe 45°\$100mm	10	Procured by JICA
15-18	Deformed Pipe 45°@75mm	4	Procured by JICA
15-19	Deformed Pipe 22 1/2°p150mm	4	Procured by JICA
15-20	Deformed Pipe 22 1/2° \$100mm	6	Procured by JICA
15-21	Deformed Pipe 22 1/2° p75mm	4	Procured by JICA
15-22	Deformed Pipe 11 1/4*0150mm	4	Procured by JICA
52-61	Deformed Pipe 11 1/4" \$100mm	4.	Procured by JICA
15-24	Deformed Pipe 11 1/4° φ/5mm	4	Procured by JICA
52-51	Deformed Pipe 90 KF @100mm		Procured by JICA
15-26	Deformed Pipe @150mm×@100mm	m •	Procured by JICA
12-21	Deformed Pipe @150mm×@100mm		Procured by JICA
07-01	Deformed Pipe 45 @100mm	4	Procured by JICA
12-29	Detormed Pipe 22 1/2-0100mm	4	Procured by JICA
10	Kepair valveo/jmm×Hiuumm	1	Procured by JICA
17-1	Fire Hydrant 8103-2000 w75mm		Procured by JICA
17-2	Fire Hydrant Case MR-1 H=880		Procured by JICA
17-3	Fire Hydrant Case MR-16-101		Procured by IICA
18	Air Valve		
18-1	Air Valve 025mm	2	Procured by JICA
18-2	Air Valve Flange@25mm	2	Procured by JICA
19	Ductile Iron Pipe Joint Parts		Procured by JICA
19-1	Pipe Joint Parts ¢150mm	10	Procured by JICA
19-2	Pipe Joint Parts @100mm	25	Procured by JICA
19-3	Pipe Joint Parts @75mm	10	Procured by JICA
20	Ductile Iron Pipe Special Ring		
20-1	Special Ring @150mm	15	Procured by JICA
20-2	Special Ring @100mm	40	Procured by JICA

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41-4	Elance (4) w100mm		monted by IICA
41-5	Flance (1) @75mm		rocured by JICA
41-6	Flance (2) 0100mm	10 P	rocured by JICA
42	Stainless Steel bolt and nut		
42-1	SUS BT.NTp16mm x L75mm	250 P	rocured by JICA
42-2	SUS BT.NT@16mm x L80mm	120 P	rocured by JICA
42-3	SUS BT.NT@12mm x L55mm	20 P	rocured by JICA
42-4	SUS BT.NT@16mm x L60mm	20 P	rocured by JICA
44-5	SUS B1.N1@16mm X L65mm	20   P	rocured by JICA
43-1	Flance Packing 020mm	10 P	rocured by IICA
43-2	Flance Packing @25mm	10 P	rocured by JICA
43-3	Flange Packing @40mm	10 P	rocured by JICA
43-4	Flange Packing ¢50mm	5	rocured by JICA
43-5	Flange Packing @75mm	10 P	rocured by JICA
43-6	Flange Packing @100mm	15 P	rocured by JICA
43-7	Flange Packing @150mm	25 P	rocured by JICA
43-8	Flange Packing @100mm 10K	10 P	rocured by JICA
44	Level Regulating Valve	a	Political by IICA
44-2	Level Regulating Valve 020mm	3	rocured by JICA
45	Check Valve		
45-1	Check Valve p20mm	10 P	rocured by JICA
45-2	Check Valve p25mm		rocured by JICA
45-3	Check Valve p40mm	1	rocured by JICA
16	Sluice Valve		
46-1	Sluice Valve p20mm	20 P	rocured by JICA
46-2	Sluice Valve oz5mm	- I 01	rocured by JICA
47.1	Ston Valve ind/mm		FOCUTEd by ICA
47-2	Stop Valve (050mm	2	rocured by JICA
47-3	Stop Valve Box L125mm×W400mm	5	rocured by JICA
18	Pipe Drilling Machine		
48-1	Pipe Drilling Machine 2N	а 	rocured by JICA
48-2	Pipe Drilling Machine S2A	1 	rocured by JICA
48-3	Pipe Drilling Machine 020mm	2 P	rocured by JICA
1-07	Engline Cutter RK7650H	4	rocured by IICA
49-2	Engine Cutter 195599-9 filter	- T	rocured by JICA
49-3	Engine Cutter 225094-6 Vbelt	3 P	rocured by JICA
0	Electromagnetic Flow Meter an Accessories		
50-1	Electromagnetic Flow Meter Set MagneW3000 FLE	1	rocured by JICA
50-2	Electromagnetic Flow Meter Set Fastening set	7 0	rocured by JICA
50-4	Flectromagnetic Flow Meter Set 185091 Communit		rocured by IICA
10	Pump	-	
51-1	Pump T-100K	2 P	rocured by JICA
51-2	Pump PP-201T	1 P	rocured by JICA
25	Bulb Opener No.1721	2	rocured by JICA
2	Tamper No.5231	2 T	rocured by JICA
4	I Orque Wrench KM-JULYN I		rocured by JICA
2 4	Chain Pipe Wrench I WIJON	2	rocured by JICA
56-1	Pipe Wrench PW-SD30	5 P	rocured by JICA
56-2	Pipe Wrench PW-SD60	5 P	rocured by JICA
56-3	Adjustable Angle Wrench H-300	5 P	rocured by JICA
56-4	Adjustable Angle Wrench H-450	5 P	rocured by JICA
56-5	Adjustable Angle Wrench H-600	5	rocured by JICA
56-6	Ratchet Wrench RWH-0924	5 P	ronired by JICA

VPSocket @40mm VPelbow @20mm	20	Procured by JICA Procured by JICA
w	20	Procured by JICA
w p40mm	20	Procured by JICA
20mm	10	Procured by JICA
p30mm	10	Procured by JICA
p40mm	2	Procured by JICA
фолтт 	n .	Procured by JICA
	4	
unt @100mm	4	Procured by JICA
ser Joint (1) @150mm ser Joint (2) @100mm	-	Procured by JICA
ser Joint (s) #100000		Buotical builds
ser Joint (1) & Domini ser Joint (2) (6100mm	15	Produced by IICA
Joint @100mm	-	Procured by JICA
Clamp		
air Clamp for Plastic Pipe @75mm	1	Procured by JICA
air Clamp for Plastic Pipe	-	Procured by JICA
air Clamp for Plastic Pipe @150mm	1	Procured by JICA
or Polyvinyl Chloride Pipe		
for Polyvinyl Chloride Pipe p20mm	10	Procured by JICA
for Polyvinyl Chloride Pipe 925mm	10	Procured by JICA
for Polyvinyl Chloride Pipe p40mm	10	Procured by JICA
/alve for Polyvinyl Chloride Pipe		
e Valve ¢150mm	1	Procured by JICA
e Valve ¢100mm	2	Procured by JICA
ive for Polyvinyl Chloride Pipe Suug	00	
the for Folyming Childride Fipe 289	2	Librared by Jick
mm×14000mm	10	Procired by IICA
mm×L4000mm	5	Procured by JICA
hmm×L4000mm	5	Procured by JICA
mm×L4000mm	2	Procured by JICA
0mm×L4000mm	4	Procured by JICA
for Polyethylene Powder Lined Steel Pipe	-	
ket φ20mm	20	Procured by JICA
ket (p/2)mm	20	Procured by JLA
ket @40mm	0	Procured by JICA
ket promm	n 90	Procured by JICA
	02	Procured by JICA
	02	Procured by JICA
W POINT	50	Procised by IICA
ow of 00mm	10	Procured by JICA
20mm	20	Procured by IICA
25mm	20	Procured by JICA
10mm	5	Procured by JICA
00mm	2	Procured by JICA
იი დ20mm	5	Procured by JICA
on <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u>	5	Procured by JICA
ծո ֆ40mm	5	Procured by JICA
ole φ20mm	10	Procured by JICA
ole φ25mm	10	Procured by JICA
ole φ40mm	10	Procured by JICA
ole of 100mm	10	Procured by JICA
tor Polyetnyiene Powaer Linea Steel Pil Te (1) m20mm	Je   4	Drocticed by IICA
	+	Provided by JICA

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ovember 2019)		Cost (kyat)	368.965.173		574 370 205	000'0 i 0'E 00	1.44	50,108,620		125,943,116		458,703,060		41,000,000	15,000,000	2,401,358
. Local cost borne by Myanmar side (as of N		Item	Equipment and construction costs for flow meter chambers and kiosk including	costs for safety measures in construction	Rearents costs on water quality test for water quality equinment provided	וצבמלבווים בספום הוו אמנבו לחמוול ובפורוהו אמנבו לחמוול בלחולוובוור לו ההאותבת	Destation and maintenance costs of the nuovided PCs for monitoring Pls	Updating costs by anti-virus for the above provided PCs		NKW pilot project (including equipment, machine, labor, materials, etc.)		NRW training yard consultruction (including equipment, machine, labor, materials, etc.)	(mm)	Nyaughnapin WTP improvement pilot project	Reservoir water treatment pilot project	Tax, commission fee etc. of delivery and registration for the equipment procured and transmitted from the Japanese side.
nnex 6		No.	-	•	0	U		m		4		ŝ		9	2	œ
Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA	Procured by JICA					
5	1	1		2	2	5	5	5	4	2	5					

 56-7
 Ratchet Wrench, RWH-0930

 57
 Pipe Electrofusion Unit MSA2.1

 57.1
 Pipe Electrofusion Unit MSA2.1

 57.2
 Pipe Electrofusion Unit WF8430

 58
 S8

 58.3
 Pipe Cutter PE1-75

 58.4
 Pipe Cutter PE1-75

 58.5
 Pipe Cutter PE1-75

 58.6
 Pipe Cutter PE1-75

 58.7
 Pipe Cutter PE1-75

 58.6
 Pipe Cutter PE1-75

 58.6
 Pipe Cutter PE1-50

 58.6
 Pipe Cutter PE1-50

 59
 Water Pressure Gauge EA729GM-20

 60
 Water Meter and Accessories

 60-1
 Water Meter NFDM100

 60-3
 Water Meter Storage Case MB205B

60,877,886

Electricity cost of project offices, equipment provided and construction of flow

Development of customer database and billing software

Total 10

meter chambers

6

164,476,178

2,411,846,196

Note; The amoung of item 2 includes all expenditures for reagents since project started.

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JFY	Air Fare	Biz Trip(Non Air Fare)	Miscellaneous	Total (USD)	Total (JPY)
2015	0	0	0	0	0
2016	1,898	3,227	35,682	40,807	4,444,896
2017	1,877	2,145	1,861	5,883	653,147
2018	5,235	2,134	8,774	16,143	1,784,096
2019	2,492	1,496	3,630	7,618	830,630
Total	11,502.00	9,002.00	49,947.37	70,451.37	7,712,769.00

Annex 7. Local cost bome by Japanese side (only activities cost for a long-term expert)

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