

**REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORKS AND HOUSING
DIRECTORATE GENERAL OF WATER RESOURCES,
RESEARCH AND DEVELOPMENT AGENCY,
HUMAN RESOURCES DEVELOPMENT AGENCY**

**THE PROJECT ON CAPACITY DEVELOPMENT FOR
RIVER BASIN ORGANIZATIONS IN
INTEGRATED WATER RESOURCES MANAGEMENT IN
THE REPUBLIC OF INDONESIA (PHASE II)**

PROJECT COMPLETION REPORT

DECEMBER 2018

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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Location Map

Source: U.S. Central Intelligence Agency 2002

**The Project on Capacity Development for River Basin Organizations in
Integrated Water Resources Management in the Republic of Indonesia (Phase II)**

Project Completion Report

Location Map

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Annex 2	List of Products (Report, Manuals, Handbooks, etc.) Produced by the Project
Annex 3	PDM (All versions of PDM)
Annex 4	R/D, M/M, Minutes of JCC
Annex 5	Monitoring Sheet
Annex 6	Products
Annex 6-1	Reports

No.	Titles	Outputs
001	Report on Activity 1 -1 to 1-5 for BBWS Ciliwung Cisadane	Output 1
002	Site Survey Result and Proposal of Landscape Plan for Telaga Saat, Upper Ciliwung at BBWS Ciliwung Cisadane	Output 1
003	Report on Activity 1 -1 to 1-5 at BWS Sulawesi 1	Output 1
004	Report of TOPOGRAPHIC (River Cross Section) SURVEYS AT TONDANO RIVER, TIKALA RIVER, AND SARJO RIVER	Output 1
005	Report of GEODETIC SURVEYS AT MALALAYANG RIVER (New BM Installment)	Output 1
006	Report of TOPOGRAPHIC (River Cross Section) SURVEYS AT MALALAYANG RIVER	Output 1
007	Collection Material & Reference on Dam Operation & Maintenance at BWS Sulawesi 1	Output 1
008	Report of Training on Dam Operation & Maintenance, in Malang on February 2016	Output 2
009	Report of Training on Water Allocation, in Makassar, on February 2016	Output 2
010	Report of Training on Flood Management, in Manado on May 2016	Output 2
011	Report of River Maintenance Training, in Jakarta on August 2016	Output 2
012	Report of Training on Maintenance for Water Resources Infrastructures, in Bandung on August 2016	Output 2
013	Report of Training on Water Quality Management in Urban Rivers, in Jakarta on September 2016	Output 2
014	Report of Training on Operation & Maintenance for Irrigation, in Surabaya on October 2016	Output 2
015	Report of Training on River Rehabilitation, in Jakarta on November 2016	Output 2
016	Report of Training on Benchmarking, in Solo on March 2017	Output 2
017	Report of Training on Sediment Management for Dam, in Yogyakarta on	Output 2

	April 2017	
018	Report of Training on Calculation of Water Balance, in Yogyakarta on August 2017	Output 2
019	Report of Training on Design of River Facility Structures, in Padang on September 2017	Output 2
020	Report of Training on RBO Performance Benchmarking for BBWS and BWS in West Region, in Palembang on April 2018	Output 2
021	Report of Training on RBO Performance Benchmarking for BBWS and BWS in East Region, in Mataram on April 2018	Output 2

Annex 6-2 Manuals

No.	Titles	Outputs
001	Manual on High Water Flow Measurement at Tikala, Sario and Malalayang at BWS Sulawesi 1	Output 1
002	Manual on Periodical Maintenance for AWLR (Microwave Type) at Tikala for BWS Sulawesi 1	Output 1
003	Manual on Periodical Maintenance for ARR 'Tipping Bucket Type) at Kuwil Kaleosan at BWS Sulawesi 1	Output 1

Supplementary Document 2/3

Annex 6-3 Seminars

No.	Titles	Outputs
001	Kick Off Seminar on Capacity Development Activity at BWS Sulawesi 1	Output 1
002	Seminar on Activity 1-6, OJT on Dam O/M Rule for Kuwil Dam, at BWS Sulawesi I	Output 1
003	Field Seminar on Dam Operation & Maintenance for BWS Sulawesi I	Output 1
004	Seminar on High Water Flow Measurement and Dam O/M Rule at BWS Sulawesi I	Output 1
005	Technical Information Sharing Seminar on Sediment Management of Dam Reservoir at BWS Sulawesi I	Output 1
006	Seminar and Site Practice on Hydrology Instrument Maintenance	Output 1
007	Wrap Up Seminar on Activity and Output at BWS Sulawesi I	Output 1

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Annex 6-4 Training Curriculum, Syllabus, Pre/Post Test

No.	Titles	Outputs
001	Training on Dam Operation & Maintenance, in Malang on Feb. 2016	Output 2
002	Training on Water Allocation, in Makassar, on Feb. 2016	Output 2
003	Training on Flood Management, in Manado on May 2016	Output 2
004	Training on River Facility Maintenance, in Jakarta on August 2016	Output 2
005	Training on Maintenance for Water Resources Infrastructure, in Bandung on August 2016	Output 2
006	Training on Water Quality Management in Urban Rivers, in Jakarta on September 2016	Output 2
007	Training on Operation & Maintenance for Irrigation, in Surabaya on October 2016	Output 2
008	Training on River Rehabilitation, in Jakarta on November 2016	Output 2
009	Training on Assessment of BBWS's Performance for Benchmarking, in Solo on March 2017	Output 2
010	Training on Sediment Management for Dam, in Yogyakarta on April 2017	Output 2
011	Training on Calculation of Water Balance for Water Allocation Planning, in	Output 2

	Semarang on August 2017	
012	Training on Design of River Facility Structures, in Padang on September 2017	Output 2
013	Training on RBO Performance Benchmarking for BBWS and BWS in West Region, in Palembang on April 2018	Output 2
014	Training on RBO Performance Benchmarking for BBWS and BWS in East Region, in Mataram on April 2018	Output 2

Annex 6-5 Reviewed Module as Certificated Official Regulation/Standard

No.	Titles	Outputs
001	Ministerial Regulation 17/PRT/M/2017 on Guidelines for the establishment of TKPSDA at the river basin level	Output 3
002	Ministerial Regulation 27/PRT/M/2015 on Dam Output 3	Output 3
003	SNI 7847:2012 on Waste Water, Specification on Processing Result Part 1: Mud from Pulp and Paper Factories	Output 3
004	SNI 8065:2016 on analysis method and how to control water seepage for fill type dams Output 3	Output 3
005	SNI 8283:2016 on Depth measurement method uses echo sounding to produce a bathymetry map Output 3	Output 3

Abbreviations

ARR	Automatic Rainfall Recorder
AWLR	Automatic Water Level Recorder
BBWS	Large River Basin Organization (Balai Besar Wilayah Sungai)
BPSDM	Human Resources Management Agency (Badan Pengembangan Sumber Daya Manusia)
RBO (BWS)	River Basin Organizations (Balai Wilayah Sungai)
Balai DIKLAT	Training Office
C/P	Counterpart Personnel
DGWR	Directorate General of Water Resources
HRDA	Human Resources Development Agency
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JWA	Japan Water Agency
MLIT	Ministry of Land, Infrastructure, Transport and Tourism Japan
OJT	On-the-Job Training
O/M	Operation and Maintenance
PIU	Project Implementation Unit
POLA	Strategy (of Water Resources Management)
PPK	Committeemen Making Officer
PUPR	Ministry of Public Works and Housing
PUSDIKLAT	Training Center
RDA	Research and Development Agency
RENCANA	Plan (of Water Resources Management)
SAKTER	Project Unit
SDA	Water Resources
SISDA	Management of Water Resources Information System
Sub-Dit	Sub Directorate
TKPSDA	Coordination Team for Water Resources Management

CHAPTER 1 BASIC INFORMATION OF THE PROJECT

1.1 Country

The Republic of Indonesia (hereinafter referred to as “Indonesia”) is a Muslim majority country, which is located in the southern part of Southeast Asia with a population of approximately 260 million. The capital city Jakarta is in Java which is most populated island of the country. The archipelago country has more than 13,000 island and stretches 5,110 km wide.

According to the World Bank (hereinafter referred to as “WB”), Indonesia’s GDP per capita has increased from \$857 in 2000 to \$3,847 in 2017. Yet, more than 25.9 million out of 260 million of Indonesians still live below the poverty line.

Current Situations of Water Resource Management

The President Joko Widodo has been pushing to build 65 dams to increase the capacity of agricultural production as well as the water resource management ever since he took the seat in 2014. National Medium Term Development Plan 2015-2019 (RPJMN 2015-2019) also mentions reduction of disaster risks. However, the government realizes that there is a shortage of dam experts in various ways to manage and maintenance of the structure.

Japan has been supporting the republic in this field of water resource management including construction of Sutami Dam in Brantas River in 1961. By such a long time cooperation relationship between the two countries, former Ministry of Public Works (hereinafter referred to as “PU”) requested Japan International Cooperation Agency (hereinafter referred to as “JICA”) for a technical cooperation project to enhance the capacity of the staff of the Minister.

1.2 Title of the Project

The Project on Capacity Development for River Basin Organizations in Integrated Water Resources Management in the Republic of Indonesia (Phase II)

JICA had a Phase I project, Capacity Development Project for River Basin Organizations in Practical Water Resources Management and Technology, that implemented from 2008 to 2011. Name of the Phase 2 Project is slightly changed to delete “Practical” and “Technology” and to put “Integrated”.

1.3 Duration of the Project (Planned and Actual)

Actual Duration: 12th January 2015 to 11th January 2019, for four (4) years

Initial Planned: Four (4) years from 2014

On RD as of May 2014, duration of the project was described as “four (4) years from the date of dispatch of JICA expert of the Project”. But actual project start was delayed by expert selection and dispatching delay.

1.4 Background

The Republic of Indonesia (hereinafter referred to as “Indonesia”) faced with water shortage in rural and urban areas as well as issues of flood and water quality deterioration due to delay in its water resource management. In response to needs of dealing with these issues comprehensively in each river basin, the GOI established the Water Resources Law No.7 in 2004. The Ministry of Public Works (PU), a governmental body for river basin management, was then required to shift its focus of works from construction of river facilities to operation and management of the facilities, coordination of interests in use and distribution of water, water quality conservation, and response to issues in flood control. To promote integrated water resource management corresponding to these works, the river basin organizations (hereinafter referred to as “RBO”) have been established in river basins under the Directorate General of Water Resources (hereinafter referred to as “DGWR”), PU. In 2006, 31 RBOs were established in important basins and their activity has been started from 2007. As JICA has been implementing loan aid projects, such as the “Lower Solo River Improvement Project” (2005-2014), the “Integrated Water Resources and Flood Management Project for Semarang” (2006-2013), and the “Upper Citarum Basin Flood Management Sector Loan” (2013-2016), strengthening the capacity of RBOs is also important in terms of realizing effects of the past projects and improving management systems. However, lack of capacity of human resources and institutions has made it difficult for RBO to play its role sufficiently; thus, strengthening capacity of RBOs personnel and organizational functions has become issues to be addressed immediately. Therefore, PU drafted a plan for establishing the Dissemination Unit for Water Resources Management and Technology (hereinafter referred to as “DUWRMT”) in the Research Center for Water Resources (hereinafter referred to as “PUSAIR”) under the Research and Development Agency (hereinafter referred to as “RDA”) and strengthening RBO’s practical capacity for water resource management in collaboration with the Directorate of Water Resources Management (hereinafter referred to as “DWRM”). JICA received the request from the Indonesian government and implemented the “Project on Capacity Development for RBOs in Practical Water Resources Management and Technology” (2008-2011) (hereinafter referred to as “Project Phase I”), a technical cooperation project supporting establishment of the DUWRMT.

While activities of the Project Phase I resulted in establishment of a system that the DUWRMT strengthens practical capacity of the RBOs, the project outcome has not been disseminated enough yet. Moreover, the government of Indonesia, with the Water Resources Management Coordination Team (hereinafter referred to as “TKPSDA”) as the central actor, is currently formulating the “Water Resources Management Strategic Plan” (hereinafter referred to as “POLA”) for each basin, which will be guidelines for river basin management by 2015, and the “Water Resources Management Implementation Plan” (hereinafter referred to as “RENCANA”) to realize the POLA. In order to support the formulation of these Water Resources Management Plans for all basins as well as day-to-day activities for TKPSDA etc., RBOs are required to introduce hydrological observation facility and relevant equipment, strengthen its personnel’s capacity for analyzing hydrological data and compiling various stakeholders’ opinions, and improve systems such as standard work manuals to carry out administrative procedures in efficient and accurate manner except for some other advanced basins such as Brantas. In addition, because the Indonesian government has resumed its personnel employment around three years ago, the number of mature personnel is decreasing sharply for

their retirement while the number of mid- and junior level engineers is limited. This has resulted in a major issue of organizational management that the PU has to cope with.

In such circumstances, the PU requested GOJ for a technical cooperation for the “Project on Capacity Development for RBOs in Practical Water Resources Management and Technology Phase II” with the aims of improving practical technical and management capacity of the RBOs.

The PU is formulating the Strategy for Capacity Development on Water Resources Management to strengthen capacity of personnel and organizational functions in charge of water resource management and aiming for its approval by the minister. The PU will promote strengthening of capacity of the personnel and organizational functions through implementation of training courses based on the strategy. However, it has not yet decided specifically how to promote the capacity development. Consequently, the request of technical cooperation to the Government of Japan includes establishment of a mechanism for strengthening of capacity in a functional manner.

1.5 Overall Goal and Project Purpose

Overall Goal

The capacity of RBOs on IWRM is continuously enhanced through the developed Capacity Development Framework (CDF)

Project Purpose

The capacity of RBOs on IWRM is improved through the upgraded mechanism of the capacity development activities for RBOs

1.6 Implementing Agency

At the Beginning of the Project

Ministry of Public Works (PU)

- Directorate General of Water Resources (DGWR), and
- Research and Development Agency (RDA),

From April of 2015

Ministry of Public Works and Housing (PUPR)

- Directorate General of Water Resources (DGWR)
- Research and Development Agency (RDA), and
- Human Resources Development Agency (HRDA)

Re-organization of Ministry of Public Works was done on April 2015.

Director General of Spatial Planning in PU was moved to Ministry of Agrarian Affairs and Spatial Planning

Training Center under Secretary General was raised to the status of an Agency as “Human Resources Development Agency”

CHAPTER 2 RESULTS OF THE PROJECT

2.1 Results of the Project

2.1.1 Input by the Japanese side

(1) Long-Term Expert

Table 2.1.1 List of Long-Term Experts

Name	Position	Responsibility	Duration/MM	Organization in Japan
WATANABE Shoichi	Chief Advisor	Integrated Water Resource Management	12 Jan. 2015 to 31 Jan. 2016/12.5MM	Ministry of Land, Infrastructure Transport and Tourism
MIURA Hirohisa	Technical Expert	Water Allocation / Operation & Maintenance	26 Jan. 2015 to 11 Jan. 2019/47.5MM	Japan Water Agency
SUZUKI Kazushi	Project Coordinator	Capacity Development / Structural Management for CD / Coordination	20 Apr. 2015 to 11 Jan. 2019 / 44.5MM	-

(2) Short Term Expert

Table 2.1.2 List of Short-Term Experts

Name	Responsibility	Duration	Organization in Japan
SUGIURA Masahiro	Dam Facility Operation & Maintenance	31 Jan. to 6 Feb. 2016, for 7 Days	Japan Water Agency
OCHI Yasuhiro	Water User Coordination / Irrigation Water Allocation	21 Feb to 27 Feb. 2016, for 7 Days	Japan Water Agency
MORIYASU Kunihiro	River Maintenance	29 July. to 12 Aug. 2016 for 15 Days	Japan Water Forum
OZAWA Morio	River Rehabilitation	14 Nov. to 19 Nov. 2016, for 6 Days	Ministry of Land, Infrastructure, Transport and Tourism
MARUYAM A Jun	Dam Operation & Maintenance	22 Apr. to 28 Apr. 2018, for 7 Days	Ministry of Land, Infrastructure, Transport and Tourism
OTA Hisashi	High Water Flow Measurement (Hydrology)	22 Apr. to 28 Apr. 2018, for 7 Days	Ministry of Land, Infrastructure, Transport and Tourism
HISHIDA Akira	Dam Operation & Maintenance	22 Oct. to 28 Oct. 2018, for 7 Days	Ministry of Land, Infrastructure, Transport and Tourism

(3) C/P Training in Japan

Table 2.1.3 List of C/P Training in Japan

No.	Training Period	Participants	Place	Main Lecture	Main Lecturer
1	21 May to 29 May 2016, for 9 days	6	JICA Tokyo, JICA Kansai	Human Resources Development Flood Management Water User Charge Dam O/M River Environment	MLIT (HQs, Keihin, Toyogawa, Himeji) JWA (HQs, Arakawa Dam, Tone Barrage, Toyogawa Canal)
2	30 Oct. to 16 Nov. 2016, for 18 Days	8	JICA Tokyo, JICA Kansai	Human Resources Development Flood Management Water User Charge Dam O/M River Maintenance	MLIT (HQs, Keihin, Himeji) JWA (HQs, Arakawa Dam, Misogawa Dam, Agigawa Dam, Toyogawa Canal, Mie Canal)
3	23 July to 5 Aug. 2017, for 14 days	10	JICA Tokyo, JICA Kansai	Flood Management Water User Charge Dam O/M	MLIT (HQs, Keihin, Arakawa-karyu, Kuzuryu Dam, Biwa Lake, Himeji,

				Dam Upgrading River Environment	Tokushima JWA (HQs)
4	15 July to 27 July 2018, for 13 days	7	JICA Tokyo, JICA Kansai	Flood Management Water User Charge Dam Integrated Management Dam O/M including Dry Dam River Environment	MLIT (HQs, Keihin, Mibu River, Asuwagawa Dam, Kuzuryu Dam, Yodo River Dam, Himeji) JWA (HQs, Misogawa Dam)

(4) Equipment

Precipitation Transmitter with Data Taker

Water Level Sensor

(5) Local Cost

Total of IDR 5,660,909,973 was spent for activities in Indonesia.

(February of 2015 until September of 2018)

Table 2.1.4 Local Cost (unit: IDR)

Year	2014	2015	2016	2017	2018
Yearly Total (Rupiah)	122,255,206	655,297,825	1,572,857,973	2,060,242,801	1,250,256,167
Miscellaneous	119,718,806	312,219,925	985,918,273	1,147,104,451	746,982,038
Air Fare	2,346,400	115,161,900	243,259,000	328,321,600	261,011,901
Travel Allowance	190,000	127,140,000	269,755,700	491,066,750	242,262,228
Fees and Honorarium		100,776,000	73,925,000	93,750,000	

2.1.2 Input by the Indonesian side

(1) Counterpart Staff

Project Implementation Unit was established by Ministerial Decree signed on December 29th, 2015 by the Minister of Public Works and Housing. The Decree is renewed every year. The Member of the Project Implementation Unit is below;

Table 2.1.5 PIU Membership (2017 Decree)

No	Position	Position within the Team	Role of the RBO Project
I	DIRECTOR TEAM		
1	Director General of Water Resources	Chairman and Member	Chairperson
2	Secretary of DGWR	Member	Member
3	Director General of Research and Development Agency	Member	Vice Chairperson
4	Director General of Human Resources Development Agency	Member	Vice Chairperson
5	Director of Water Resources Management, DGWR	Member	Member
6	Head of Research and Development Center of WR (PUSAIR), RDA	Member	Member
7	Head of Training Center for WR and Construction, HRDA	Member	Member
8	Head of Experimental Station for River, Research and Development Center of WR	Member	Member
9	Head of Ciliwung Cisadane RBO, DGWR	Member	Member
10	Head of Sulawesi I RBO, DGWR	Member	Member

II	TECHNICAL TEAM		
1	Head of Sub-Dir.of WR Institutional, WR Management, DGWR;	Member	Member
2	Head of Sub-Dir. of River Basin Planning, WR Management, DGWR;	Member	Member
3	Head of Sub-Dir. of Hydrology and WR Environment, WR Management, DGWR;	Member	Member
4	Head of Sub-Dir. of Planning, Dir. Irrigation and Swamp, DGWR;	Member	Member
5	Head of Sub-Dir. of Planning for Operation and Maintenance, Dir. O&M Development, DGWR;	Member	Member
6	Head of Division of Planning and Administration, Dam Center, DGWR	Member	Member
7	Head of Sub-Dir. of Tech. Assistance for River and Coastal, Dir. River and Coastal, DGWR.	Member	Member

(2) Project Office / Office Equipment

The office space including electricity was provided within the ministry.

2.1.3 Activities

(1) Activity 1

1) BBWS Ciliwung Cisadane

Activity 1-1.

Analyse and break down the expected RBO's functions and roles into daily work activities.

Activity 1-1 is divided into 2 (two) portions for effective analyze and break down, 1) Analyze the expected RBO's functions and roles, 2) Break down daily work activities of expected functions and roles.

1.1. Analyse the expected RBO's functions and roles

1.1.1. Methodology of Analysis on expected RBO's function

In the past meeting with BBWS Ciliwung Cisadane, JICA project team received several plans, reports for analysis to identify expected functions on Integrated Water Resources Management (hereinafter referred to as "IWRM"). Therefore, proposal on priority items as expected functions and roles should be analyzed by collected plans and reports.

Analysis has been conducted in 3 (three) steps as in below box;

Step 1: Comparing between current functions by Needs Survey and various items
Step 2: Integrating result of above "Step1" to find candidate expected functions and roles as proposal
Step 3: Discussion to decide expected functions and roles

1.1.2. (Step 1) Comparing between current functions and various items

- Current functions

Current functions of BBWS and BWS is mentioned on Ministerial Regulation No.20/PRT/M/2016 (No.34/PRT/M2015, No. 21/PRT/M/2010). The functions are common one among all BBWS and BWS in Indonesia.

On the other hands, result of Output 1 will be reflected to activities of Output 2. Activity of Output 2 is for all BBWS and BWS. It is effective and understandable, if we use common functions between output 1 and output 2 as indicators on CD activities.

Therefore, we decided functions and roles on No.20/PRT/M/2016 as current functions and roles for this analysis.

[Reference] Relation and reflection between outputs 1 to output 2

- (1) Outputs of activities 1-1 and 1-2 will be reflected to activity 2-5 on evaluation of capacity of RBOs and improvement of benchmarking mechanism*
- (2) Outputs of activities from 1-3 to 1-9 as "Field Practice" will be considered into activity 2-3 on making and carrying out short- and mid-term plans of CD activities*

Current Functions and Roles for analysis of output 1*

- a. Preparation of Strategic Plan (POLA) and Master Plan (RENCANA) of water resources management in the river basin
- b. Preparation of water resources management programs and action plans for water resources management in river basin
- c. Monitoring and evaluation of the implementation / application of a water resources management (POLA) and water resources management plan (RENCANA)
- d. Preparation of feasibility studies and technical planning / design / development of water resources
- e. Procurement of goods and services as well as the determining the winner (contractors) of Procurement Services Unit (ULP)
- f. Implementation of quality management systems and health and safety management systems (SMK3)
- g. Water resources management which includes the conservation and utilization of water resources and control of water damage in the basin
- h. Management of urban main drainage
- i. Management of hydrological system
- j. Management of Water resources information system (SISDA)
- k. Implementation of operation and maintenance of water resources in the river basin
- l. Implementation of technical guidance for water resources management under the authority of provinces and regencies/city
- m. Drafting / compilation and preparation of technical recommendations in licensing the use of water resources and permits utilization of water resources in the river area
- n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)
- o. Empowerment of communities in the management of water resources
- p. Implementation of financial accounting report and accounting of state property as the Accounting Unit Area
- q. Implementation of the collection, receipt and use of the cost of water resource management services (BJPSDA) in accordance with the provisions of the legislation

- r. Implementation of administrative affairs and households of BBWS as well as public communication
- s. Preparation of performance agreements and performance reports of BBWS
- t. Organize / carry out monitoring and supervision over the use of water resources and investigation of criminal offenses on water resources division

**from No.20/PRT/M/2016 (Translation into English by JICA RBO Project Team)*

- Information for the Analysis

The project team received POLA, Assessment Report and Accountability Report from BBWS Ciliwung Cisadane for analysis.

In addition, the project was suggested that capacity development activity of BBWSs and BWSs should be considered performance of PJT I and II by Director General of Water Resources of PUPR.

Therefore, the project uses three (3) information, POLA, Assessment Report and Accountability Report, for the analysis. Function and Role of PJT I and II is considered as a reference for the analysis.

Various Items

- (1) POLA on Ciliwung Cisadane River Basin
- (2) Self-Assessment Report of Performance Benchmarking of BBWS Ciliwung Cisadane (2015)
- (3) Accountability Report, Fiscal Year 2015 of BBWS Ciliwung Cisadane

Reference

- Functions and Roles of PJT I and II

- Comparing between Current Functions / Roles and Various Items

Table 2.1.6 shows 3 (three) items and 1 (one) reference, information sources and results of our analysis to find candidate current functions as expected functions / roles. We have picked up much information from each item as important / prioritized / necessary / recommended works to put on adequate current functions / role. Then, to find expected functions / roles, we put value on each current function accordance with each criterion, such as number of works, score gap between current and goal, etc.

Table 2.1.6 Items for analysis to identify expected functions and roles of BBWS Ciliwung Cisadane

No	Item	Information Source	Analyzed Result
(1)	POLA	Physical and Non-Physical Efforts	Important Functions with Detail Works
(2)	Self-Assessment Report 2015	Key Performance and Score	Prioritized Functions
(3)	Accountability Report (LAKIP) 2015	Main Activities	Necessary Works and Performance
	Self-Assessment Report and Company Profile of PJT1 and 2	Function and Duty of PJT1 and 2	

1.1.3. (Step 2) Integrating result of above “Step1” to find candidate expected functions and roles (Duties) as proposal

Table 2.1.7 shows integrating analyzed result of “Comparing between current functions / roles and various items” from each analysis and describes total score and candidate current functions as expected functions / roles.

Table 2.1.7 Integrating analyzed result and total score for Expect Functions and Roles at BBWS Ciliwung Cisadane

No.	Current Functions	BBWS Cil Cis				PJT SA Report, Company Profile
		POLA	Assessment Report	LAKIP	Analysis Result	
a	Preparation of POLA / RENCANA	Middle	Middle	Middle	Middle	6
b	Preparation of WRM Program / Plan	High	High	High	High	9
c	Monitoring of POLA / RENCANA implementation	Middle	High	High	High	8
d	Preparation of FS and technical planning / design	High	High	High	High	9
e	Procurement of goods and services	Middle	High	Middle	Middle	7
f	Implementation of SMK3 (quality, health, safety)	Middle	Middle	Middle	Middle	6
g	WRM, Conservation, Utilization, Damage Control	High	Middle	High	High	8
h	Urban main drainage	Middle	-	Low	Low	3
i	Hydrology System	Middle	Middle	Middle	Middle	6
j	WR Information System (SISDA)	Middle	Middle	High	Middle	7
k	O/M of WR	Middle	Middle	High	Middle	7
l	Technical Guidance to Local Authority	Middle	Middle	Middle	Middle	6
m	Technical Recommendation for Permission	High	Low	Low	Middle	5
n	WRM Coordination Team (TKPSDA)	High	Middle	Middle	Middle	7
o	Public Empowerment	Middle	Middle	Middle	Middle	6
p	Financial and Property Accounting Report	Middle	Middle	Middle	Middle	6
q	BJPSDA	Middle	-	Middle	Low	4
r	Administrative and general affairs	Middle	-	Middle	Low	4
s	Performance agreement / report	Middle	-	Low	Low	3
t	Monitoring WR use and Investigation of criminals	Middle	-	Middle	Low	4

- “Analysis Result” is prioritized by “Total Score”

0 – 4: Low, 5-7: Middle, 8 -: High

- “Total Score” is calculated as sum of “Weight Scoring” from 3 items, POLA, Assessment Report and LAKIP (Accountability Report)

- Priority at 3 items, POLA, Assessment Report and LAKIP, is classified by;

POLA: number of activities from Physical and Non-physical Efforts Matrix of POLA

Assessment Report: gap between current assessment score and target score

LAKIP: number of activities from the report

According to total score on Table 2.1.7, candidate functions as expected functions / roles are recognized temporarily into 5 (five) functions as below box;

Temporary expected functions / roles

- b. Preparation of water resources management programs and action plans for water resources management in river basin
- c. Monitoring and evaluation of the implementation / application of a water resources management (POLA) and water resources management plan (RENCANA)
- d. Preparation of feasibility studies and technical planning / design / development of water resources
- g. Water resources management which includes the conservation and utilization of water resources and control of water damage in the basin

1.1.4. (Step 3) Discussion to decide expected functions and roles

From PIU

- Function and Duty of PJT I and II should not applied into the analysis, because responsibility of B(B)WS and PJTs is different. Therefore, Function and Duty of PJT I and II must be a reference for the analysis, it is not included into “weight Scoring” for the analysis.

From BBWS Ciliwung Cisadane

- BBWS Ciliwung Cisadane also suggested Function and Role of PJT I and II is the reference for the analysis.
- BBWS Ciliwung Cisadane agree that “b”, “d” and “g” as expected function and role, however BBWS suggested to drop “c” from expected function and role. Because monitoring of POLA and RENCANA is currently functioned well, BBWS Ciliwung Cisadane would like to focus other function and role to improve.
- BBWS Ciliwung Cisadane suggested to include “k” and “n” as expected function and role. There are a lot of issues, concerns and programs on Operation & Maintenance of Water Resources with coordination through TKPSDA.

k: Implementation of operation and maintenance of water resources in the river basin

n: Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)

1.1.5. Confirmed expected functions in BWS Sulawesi I

After the discussion with PIU member and BBWS Ciliwung Cisadane, expected function and role for BBWS Ciliwung Cisadane was confirmed at PIU Meeting that was held on 20th September 2017 as below.

Confirmed expected functions / roles

- b. Preparation of water resources management programs and action plans for water resources management in river basin
- d. Preparation of feasibility studies and technical planning / design / development of water resources
- g. Water resources management which includes the conservation and utilization of water resources and control of water damage in the basin
- k. Implementation of operation and maintenance of water resources in the river basin
- n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)

1.2. Break down daily work activities of expected functions and roles**1.2.1. Methodology of breakdown of daily and important activities on expected RBO's function**

In the analysis of above 1.1, important / prioritized / necessary / recommended functions and works already picked up from each item, such as POLA, Self-Assessment Report, Accountability Report, and put on adequate current functions. Therefore, candidate daily / important works for expected functions / roles can be sorted out and we choose suitable daily / important works and break down into details on daily activities and important duties.

Step 1: Sort out detail duties from bellows for analyzed expected functions

1) POLA, 2) Self-Assessment Report, 3) Accountability Report

Step 2: Break down of daily activity for detail duties

1.2.2. (Step 1) Sort out detail duties from 1) POLA, 2) Self-Assessment Report, and 3) Accountability Report, for analyzed expected functions

Detail Duties from POLA, Self-Assessment Report and Accountability Report are sorted out and classified as candidate daily / important works for expected functions / roles. Table 2.1.8 to Table 2.1.12 show candidate daily / important works for each expected functions / role.

Table 2.1.8 Candidate daily / important works for expected functions / roles of “b.”

b. Preparation of water resources management programs and action plans for water resources management in river basin	
POLA	
	Plan the NCICD stage A sea embankment
	Preparing Annual Water Allocation Plan of WS Ciliwung Cisadane to be agreed TKPSDA WS Ciliwung Cisadane
	Arrange plans and implement the protection of river beds and riverbank in major rivers at WS Ciliwung - Cisadane each year
	Sampling for Water Quality Monitoring System, its frequency is 3 times in one year
	Balai support/supervise Ciawi Dam Construction Project Team, such as Land Acquisition and construction works
	Balai support/supervise River Normalization Project Team to implement smoothly
	Review / Stipulation of River Area Border around Situ to secure functions of Situ
Assessment Report	
Accountability Report	
	Detail Engineering Design on raw water infrastructure IPA (Water Treatment Plant) at Pesanggrahan and Citayam
	SID raw water infrastructure IPA Mekarsari and Legong
	The LARAP (Survey/Investigation/Design) study on the construction of the Ciawi dam
	EIA study on the construction of the Ciawi dam
	Detail of dam design Ciawi and Sukamahi Dam
	SID check dam in Ciliwung Upstream basin
	Details of situ-situ rehabilitation design in Bogor

Table 2.1.9 Candidate daily / important works for expected functions / roles of “d.”

d. Preparation of feasibility studies and technical planning / design / development of water resources	
	POLA
	Collect data and information for planning on necessary capacity as Long Storage at BKB/BKT/Cengkareng drain for reduce internal flood. And implementing activity for awareness raising of residents (Sosialization) on keep water clean at BKB/BKT/Cengkareng drain to satisfy regulation on water quality for Raw Water
	Water quality monitoring, 3 times/year
	Conducting feasibility study and design details of Limo Reservoir, Pesanggrahan River in Cinere Depok
	Review of water allocation for irrigation that intake from Katulampa weir, because irrigation area is reduced
	Implementation of study on potential water supply for raw water to JABODETABEK, to re-allocate the water from irrigation water that intake from Katulampa weir. Because irrigation area is reduced
	Collect data and information for implementation of FS and detail design of reservoirs at Pondok Benda, Angke River in Pamulang
	Collect data and information for implementation of FS and detail design of Genteng Reservoir at Cisadane River
	Implement FS on Narogong Reservoir
	Collect data and information for making a master plan for Integrated Flood Control in Ciliwung Cisadane River Basing, considering on; flood discharge scale 1:100, 1:50, 1:25 and internal flood for drainage capacity: 1:5
	Emergency Operation Plan of Situ Gintung
	Development and installation of early warning systems across all rivers
	Plan and Build sea dikes in Cilincing, Pluit, Pasar Ikan, estuary Kamal and Marunda
	Plan the NCICD stage A sea embankment
	Carry out Feasibility Study and design details of Connecting Channel between Ciliwung River to BKT
	Planning and implement of rehabilitation of sustainable levee against flood
	Plan the NCICD stage A sea embankment
	Assessment Report
	Accountability Report
	Detail Engineering Design on raw water infrastructure IP (Water Treatment Plant) at Pesanggrahan and Citayam
	SID raw water infrastructure IPA Mekarsari and Legong
	The LARAP (Survey/Investigation/Design) study on the construction of the Ciawi dam
	EIA study on the construction of the Ciawi dam
	Detail of dam design Ciawi and Sukamahi Dam
	SID check dam in Ciliwung Upstream basin
	Details of situ-situ rehabilitation design in Bogor

Table 2.1.10 Candidate daily / important works for expected functions / roles of “g.”

g. Water resources management which includes the conservation and utilization of water resources and control of water damage in the basin	
POLA	
	River Improvement of Ciliwung and Cisadane River Basin
	Activity for awareness raising of residents and public on Ciliwung River Area Border
	Strengthening efforts to implement the critical areas (vegetative and civil engineering).
	Carry out construction of the East Flood Canal (23.5 km) to finish in 2011
	Implement River Channel Improvement at Pesanggrahan, Angke, Sunter (PAS) Rivers
	Implement River Channel Improvement of Ciliwung River from TB.Simatupang up to Manggarai
	Collect data and information for design and implement "short cut" at kalibata and Kebun Baru of Ciliwung River
	Continue to implement work for additional water gate are Karet (at Manggarai, it already finished)
	Check conditions of old water gates at Ciliwung river for revitalization
	Implement Dredging for 13 River and 5 Reservoir in Jakarta, as JEDI Program (Jakarta Emergency Dredging Initiative)
	Implement River Channel Normalization in urban areas (Cimanceuri, Cirarap, Cisadane, Cengkareng Drain, Kali Sabi and Kali Dadap, Grogol, Krukut, West Canal (Adem), Mampang, Cideng, Cipinang, Buaran, Jatikramat and Cakung, Blencong, Bekasi, Cikeas, Cileungsi, Cikarang, CBL, Cilemah Abang) with Q25
	Preparation of a strategy on environment conservation in Ciliwung River Basin with BPDAS and TKPSDA WS Ciliwung Cisadane
	Start the preparation of National Movement of Partnership on Water Security (GNKPA) programs and activities
	Collect data and Information on inundated area by past floods for review Flood Hazard & Risk Maps and to open for public
	Collect data and Information on topography and landslides by past phenomenon for review Sediment Disaster Hazard & Risk Maps and to open for public
	Plan and Build sea dikes in Cilincing, Pluit, Pasar Ikan, estuary Kamal and Marunda
	Carry out construction of the East Flood Canal (23.5 km) to finish
	Implement River Channel Improvement at Pesanggrahan, Angke, Sunter (PAS) Rivers
	Implementing for Ciliwung River Management on Environment Conservation
	Implement River Channel Improvement of Ciliwung River from TB. Simatupang up to Manggarai
	Continue to implement work for additional water gate ar Karet (at Manggarai, it already finished)
	Implement Dredging for 13 River and 5 Reservoir in Jakarta, as JEDI Program (Jakarta Emergency Dredging Initiative)
	Carry out Feasibility Study and design details of Connecting Channel between Ciliwung River to BKT
	Planning and implement of rehabilitation of sustainable levee against flood
	The study on drainage system of Kemayoran and Kota Bekasi in 2016
Assessment Report	
Accountability Report	
	Technical Guidance on River Planning and Conservation
	Geotechnical study and underwater investigation of Jakarta costal area
	Detail Design (DD) restoration and upgrading of the Cekeas River
	Detai Design Flood Control of Sungai Bekasi Hilir
	EIA Study on River Channel Improvement at Cisadane River
	Development of Infiltration Wells in Ciliwung River Basin at Kab. Bogor

Table 2.1.11 Candidate daily / important works for expected functions / roles of “k.”

k. Implementation of operation and maintenance of water resources in the river basin	
POLA	
	Implementing 60% of reservoirs / situ by BBWS (for reservoirs / sites still managed by the center)
	Implement rehabilitation/OP at 27 water springs
	Implementation of OP for water resources infrastructure (100% Service Level)
	Carry out the OP for Rivers and Drainage channels throughout the year
	Conducting socialization through TKPSDA WS Ciliwung Cisadane for public awareness about the risk of land subsidence by intake ground water in a sustainable manner
Assessment Report	
Accountability Report	
	Technical inspections on raw water, situ and dam
	OP Manual on Raw Water Management of Cisarua
	OP Training on Situ and dam
	Thorough inspection Gintung dam.
	Supervision of Situ Maintenance
	Routine maintenance of Situ in the Ciliwung Cisadane river area
	OP of Telemetry
	Routine OP of River Channel in the Ciliwung Cisadan river area
	Facilitation for technical skills of OP officials

Table 2.1.12 Candidate daily / important works for expected functions / roles of “j.”

n. Facilitation of Coordination Team of Water Resources Management at the river basin(TKPSDA)	
POLA	
	Implementation of the detail design for raw water supply/utilizing, volume of water for western and eastern canal from the katulampa weir for irrigation
	Activate the Secretariat of TKPSDA Ciliwung Cisadane in a sustainable manner
	Plan and allocate water through agreements in TKPSDA as well as carrying out river flushing
	Review and implement the water allocation in Cisadane river for making agreement
	Implement water allocation of Cisadane River according to the agreement in a sustainable manner
	Carry out cooperation and coordination with stakeholders for flood management
	Building commitment among stakeholders on tasks and budget of TKPSDA WS Cil-Cis for water resources management in a sustainable manner
Assessment Report	
Accountability Report	
	Facilitating NATIONAL MOVEMENT OF PARTNERSHIP (GNKPA) 2. on WATER SAFETY
	Preparing technical recommendations on water use (SIPPA)

1.2.3. (Step 2) Discussion for confirmation of daily and important activities

The project team had discussion with BWS Sulawesi I to confirm of daily / important activities (works). We got new ideas and revisions of candidate daily / important activities for each expected functions / role as

below;

- b. Preparation of water resources management programs and action plans for water resources management in river basin
 - ✓ BBWS Ciliwung Cisadane already formulated POLA. RENCANA was also already drafted and submitted to PUPR HQs.
 - ✓ There are several important program/plan/designs that should be formulated or finalized, such as NCICD, Dam Constructions, Rehabilitation of Situ-Situ, Annual Water Allocation and so on. This information is included into the Table 2.1.8 as Daily and Importance Activity.
 - ✓ Regarding Water Allocation plan, BBWS Ciliwung Cisadane already had the plan of Ciliwung and Bekasi River. But the plan of Cisadane River has not been formulated yet.
- d. Preparation of feasibility studies and technical planning / design / development of water resources
 - ✓ BBWS Ciliwung Cisadane has many studies and plans that have to finalize, such as Dam and Reservoir construction/rehabilitation, Flood Control Plan and so on. This information is included into the Table 2.1.9.
 - ✓ Regarding Water Allocation plan, BBWS Ciliwung Cisadane already had the plan of Ciliwung and Bekasi River. But the plan of Cisadane River has not been formulated yet.
- g. Water resources management which includes the conservation and utilization of water resources and control of water damage in the basin
 - ✓ There are many activities that should implement, such as River Channel Normalization, Water Security and Environment Conservation with Stakeholders through TKPSDA and so on. Almost all the activity is mentioned in Table 2.1.10.
 - ✓ Regarding utilization of water resources, BBWS Ciliwung Cisadane emphasizes that formulation of water allocation plan in Cisadane is also important.
- k. Implementation of operation and maintenance of water resources in the river basin
 - ✓ Regarding operation & maintenance of water resources in Ciliwung Cisadane river basin, one of the significant issues is Dam/Situ operation & maintenance.
 - ✓ On the other hand, land subsidence is also one of the important issues. As BBWS, we should promote public awareness on risk of land subsidence.
 - ✓ These above topics are included into the Table 2.1.11.
- n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)
 - ✓ BBWS as secretariat office of TKPSDA, we strengthen their activity more. Therefore, agreement on tasks and budgeting of TKPSDA among members and related organizations is indispensable.
 - ✓ As an urgent issue, BBWS with TKPSDA should make agreement on water allocation in Cisadane. Therefore, BBWS should create a water balance (water availability and demand) in Cisadane, especially irrigation from Bendung Pasar Baru.

1.2.4. Confirmed daily and important activities

b. Preparation of water resources management programs and action plans for water resources management in river basin

- Planning and Supporting for making design of infrastructures, Sea dike for NCICD, Ciawi and Sukamahi Dam, River Normalization project including River Area Boarder Management
- Preparation of Annual Water Allocation Plans in Cisadane River
- Detail Design of Rehabilitation for Situ (Small Dams)
- Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation
- Water Quality Sampling and Analysis (3 times in one year)
- Support for design for raw water infrastructures from engineering view point

d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources

- Flood Control Plan (Flood Scale: 1:100, 1:50, 1:25), internal Flood Plan (1:5) in Ciliwung Cisadane River Basin
- River Environment Improvement Activity, awareness raising for residents for keeping water clean for raw water
- Revision of Water Allocation Plan, especially implementation of study on potential water supply for raw water to JABODETABEK, to re-allocate the water from irrigation water that intake from Katulampa weir. Because irrigation area is reduced
- Feasibility Study and Design of Small Reservoirs (Dams), Limo Reservoir at Pesanggrahan River in Cinere Depok, Reservoirs at Pondok Benda Angke River in Pamulang, Genteng Reservoir at Cisadane River, Narogong Reservoir
- Emergency Operation Plan of Situ Gintung
- Planning and Design of Sea Dikes
- Planning and Implementing levee (revetment) rehabilitation
- Detail Design of Rehabilitation for Situ (Small Dams)
- Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation
- Water Quality Sampling and Analysis (3 times in one year)
- Support for design for raw water infrastructures from engineering view point

g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- River Normalization and Channel Improvement in Ciliwung and Cisadane, and also Pesanggrahan, Angke, Sunter (PAS) Rivers. Additionally, short-cut at Kalibata and Kebun Baru of Ciliwung River
- Urban River Improvement at Cimanceuri, Cirarap, Cisadane, Cengkareng Drain, Kali Sabi, Kali Dadap, Grogol, Krukut, West Canal (Adem), Mampang, Cideng, Cipinang, Buaran, Jatikramat and Cakung, Blencong, Bekasi, Cikeas, Cileungsi, Cikarang, CBL, Cilemah Abang) with Flood Scale 1:25
- Check the current condition of existing/old gate at Ciliwung River, Manggarai and Karet
- Preparation of Environment Conservation Strategy in Ciliwung River Basin and implementation of Environment Conservation Management, including National Movement of Partnership on Water Security (GNKPA) programs and activities
- Hazard Maps on Flood and Sediment Disaster
- Dredging at 13 rivers and 5 reservoirs in Jakarta
- Feasibility Study, Design and Construction of connecting channel between Ciliwung River and BKT
- Rehabilitation of Levee for Flood Control
- The Study of Drainage System in Kemayoran and Bekasi City
- Technical Guidance on River Planning and Conservation
- Detail Design for Flood Control at Cikeas, Bekasi and Cisadane River. Retention Facility and River Channel Improvement
- Geotechnical study and underwater investigation of Jakarta coastal area
- Development of Infiltration Wells in Ciliwung River Basin at Kab. Bogor

k. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- Implementation of Operation and Maintenance of Reservoirs (Situ), 60% of all Reservoirs in Ciliwung Cisadane River (other 40% reservoirs by local)
- Implementation of rehabilitation and O&M at 27 ponds
- Implementation of adequate O&M that service quality level should reach 100%
- Implementation of River and Drainage channel through the year
- Socialization and awareness raising of resident with TKPSDA on subsidence risk for underground water intake control
- Supervision, Inspection and Operation & Maintenance of Small Reservoirs (Situ) in Ciliwung Cisadane River Basin, especially inspection of Situ Gintung
- Routine Operation & Maintenance of River Channel
- Operation & Maintenance of Telemetry System

n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)

- Implementation of Water Allocation Plan for Raw Water and detail design of facility especially check volume from Katulampa Weir for Irrigation
- Plan and Allocate for River Flushing with agreement with stakeholders
- Review and Water Allocation Plan in Cisadanr River for stakeholder's agreement
- Making Cooperation with stakeholders for Flood Management through TKPSDA
- Facilitation of National Movement of Partnership (GNKPA) for water security
- Preparation for technical recommendation on Water User Right (SIPPA)

Activity 1-2.

Identify current functions and roles, and the actual daily work activities of several RBOs, and sort out the activities to be strengthened by comparing the actual activities with the ideal functions and roles mentioned above in 1-1.

Sort out the activities to be strengthened by comparing the actual activities with the ideal functions and roles mentioned above in Activity 1-1. Through discussion between BBWS Ciliwung Cisadane, PIU and JICA project team, activities to be strengthened had been sorted out as below.

b. Preparation of water resources management programs and action plans for water resources management in river basin

- Planning and Supporting for making design of infrastructures, Sea dike for NCICD, River Normalization project including River Area Boarder Management
- Preparation of Annual Water Allocation Plans in Cisadane River
- *Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation*
- Water Quality Sampling and Analysis (3 times in one year)

d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources

- Flood Control Plan (Flood Scale: 1:100, 1:50, 1:25), internal Flood Plan (1:5) in Ciliwung Cisadane River Basin
- River Environment Improvement Activity, awareness raising for residents for keeping water clean for raw water
- Revision of Water Allocation Plan, especially implementation of study on potential water supply for raw water to JABODETABEK, to re-allocate the water from irrigation water that intake from Katulampa weir. Because irrigation area is reduced
- Feasibility Study and Design of Small Reservoirs (Dams), Limo Reservoir at Pesanggrahan River in Cinere Depok, Reservoirs at Pondok Benda Angke River in Pamulang, Genteng Reservoir at Cisadane River, Narogong Reservoir
- Emergency Operation Plan of Situ Gintung
- Planning and Design of Sea Dikes
- Planning and Implementing levee (revetment) rehabilitation
- Detail Design of Rehabilitation for Situ (Small Dams)
- Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation
- Water Quality Sampling and Analysis (3 times in one year)
- Support for design for raw water infrastructures from engineering view point

g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- River Normalization and Channel Improvement in Ciliwung and Cisadane, and also Pesanggrahan, Angke, Sunter (PAS) Rivers. Additionally, short-cut at Kalibata and Kebun Baru of Ciliwung River
- Urban River Improvement at Cimanceuri, Cirarap, Cisadane, Cengkareng Drain, Kali Sabi, Kali Dadap, Grogol, Krukut, West Canal (Adem), Mampang, Cideng, Cipinang, Buaran, Jatikramat and Cakung, Blencong, Bekasi, Cikeas, Cileungsi, Cikarang, CBL, Cilemah Abang) with Flood Scale 1:25
- Check the current condition of existing/old gate at Ciliwung River, Manggarai and Karet
- Preparation of Environment Conservation Strategy in Ciliwung River Basin and implementation of Environment Conservation Management, including National Movement of Partnership on Water Security (GNKPA) programs and activities
- Hazard Maps on Flood and Sediment Disaster
- Dredging at 13 rivers and 5 reservoirs in Jakarta
- Feasibility Study, Design and Construction of connecting channel between Ciliwung River and BKT
- Rehabilitation of Levee for Flood Control
- The Study of Drainage System in Kemayoran and Bekasi City

k. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- Implementation of Operation and Maintenance of Reservoirs (Situ), 60% of all Reservoirs in Ciliwung Cisadane River (other 40% reservoirs by local)
- Implementation of rehabilitation and O&M at 27 ponds
- Implementation of adequate O&M that service quality level should reach 100%
- Implementation of River and Drainage channel through the year
- Socialization and awareness raising of resident with TKPSDA on subsidence risk for underground water intake control
- Supervision, Inspection and Operation & Maintenance of Small Reservoirs (Situ) in Ciliwung Cisadane River Basin, especially inspection of Situ Gintung
- Routine Operation & Maintenance of River Channel
- Operation & Maintenance of Telemetry System

n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)

- Implementation of Water Allocation Plan for Raw Water and detail design of facility especially check volume from Katulampa Weir for Irrigation
- Plan and Allocate for River Flushing with agreement with stakeholders
- Review and Water Allocation Plan in Cisadane River for stakeholder's agreement
- Making Cooperation with stakeholders for Flood Management through TKPSDA
- Facilitation of National Movement of Partnership (GNKPA) for water security
- Preparation for technical recommendation on Water User Right (SIPPA)

Activity 1-3.

Identify priority issues, which are necessary to be tackled with stakeholders as common and important targets, in the selected RBOs as pilot fields.

Candidate issues which are necessary to be tackled with stakeholders are selected from result of Activity 1-2 "activities to be strengthened" as below. The issues will be selected by discussion with PUPR, BBWS Ciliwung Cisadane.

b. Preparation of water resources management programs and action plans for water resources management in river basin

- Planning and Supporting for making design of infrastructures, Sea dike for NCICD, River Normalization project including River Area Boarder Management
- Preparation of Annual Water Allocation Plans in Cisadane River
- *Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation*
- Water Quality Sampling and Analysis (3 times in one year)

d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources

- Flood Control Plan (Flood Scale: 1:100, 1:50, 1:25), internal Flood Plan (1:5) in Ciliwung Cisadane River Basin
- River Environment Improvement Activity, awareness raising for residents for keeping water clean for raw water
- Revision of Water Allocation Plan, especially implementation of study on potential water supply for raw water to JABODETABEK, to re-allocate the water from irrigation water that intake from Katulampa weir. Because irrigation area is reduced
- Feasibility Study and Design of Small Reservoirs (Dams), Limo Reservoir at Pesanggrahan River in Cinere Depok, Reservoirs at Pondok Benda Angke River in Pamulang, Genteng Reservoir at Cisadane River, Narogong Reservoir
- Emergency Operation Plan of Situ Gintung
- Planning and Design of Sea Dikes
- Planning and Implementing levee (revetment) rehabilitation
- Detail Design of Rehabilitation for Situ (Small Dams)
- Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation
- Water Quality Sampling and Analysis (3 times in one year)
- Support for design for raw water infrastructures from engineering view point

h. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- River Normalization and Channel Improvement in Ciliwung and Cisadane, and also Pesanggrahan, Angke, Sunter (PAS) Rivers. Additionally, short-cut at Kalibata and Kebun Baru of Ciliwung River
- Urban River Improvement at Cimanceuri, Cirarap, Cisadane, Cengkareng Drain, Kali Sabi, Kali Dadap, Grogol, Krukut, West Canal (Adem), Mampang, Cideng, Cipinang, Buaran, Jatikramat and Cakung, Blencong, Bekasi, Cikeas, Cileungsi, Cikarang, CBL, Cilemah Abang) with Flood Scale 1:25
- Check the current condition of existing/old gate at Ciliwung River, Manggarai and Karet
- Preparation of Environment Conservation Strategy in Ciliwung River Basin and implementation of Environment Conservation Management, including National Movement of Partnership on Water Security (GNKPA) programs and activities
- Hazard Maps on Flood and Sediment Disaster
- Dredging at 13 rivers and 5 reservoirs in Jakarta
- Feasibility Study, Design and Construction of connecting channel between Ciliwung River and BKT
- Rehabilitation of Levee for Flood Control
- The Study of Drainage System in Kemayoran and Bekasi City

k. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- Implementation of Operation and Maintenance of Reservoirs (Situ), 60% of all Reservoirs in Ciliwung Cisadane River (other 40% reservoirs by local)
- Implementation of rehabilitation and O&M at 27 ponds
- Implementation of adequate O&M that service quality level should reach 100%
- Implementation of River and Drainage channel through the year
- Socialization and awareness raising of resident with TKPSDA on subsidence risk for underground water intake control
- Supervision, Inspection and Operation & Maintenance of Small Reservoirs (Situ) in Ciliwung Cisadane River Basin, especially inspection of Situ Gintung
- Routine Operation & Maintenance of River Channel
- Operation & Maintenance of Telemetry System

n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)

- Implementation of Water Allocation Plan for Raw Water and detail design of facility especially check volume from Katulampa Weir for Irrigation
- Plan and Allocate for River Flushing with agreement with stakeholders
- Review and Water Allocation Plan in Cisadane River for stakeholder's agreement
- Making Cooperation with stakeholders for Flood Management through TKPSDA
- Facilitation of National Movement of Partnership (GNKPA) for water security
- Preparation for technical recommendation on Water User Right (SIPPA)

As a result of discussions among BBWS Ciliwung Cisadane, PIU and JICA Project Team, all activity items that were selected as activity to be strengthened are selected as priority issues that should be tackled with stakeholders. Because, BBWS Ciliwung Cisadane manages several rivers where flow in JABODETABEK. It includes DKI, West Java and Banten Provinces and there many kinds of stakeholders and water users. Therefore, all activity from Activity 1-2 is related with stakeholders and important.

Activity 1-4.

Identify concrete work activities to tackle the priority issues recognized in “1-3”, and area of the capacity development necessary for those work activities in the selected RBOs.

Before making concrete work activity, we selected adequate activities for Capacity Development for BBWS Ciliwung Cisadane. Some of the priority activities that were selected in Activity 1-4 should be conducted other agencies, consultants and contractors. Some of the activities has been conducted in concrete plan that coordinated with stakeholders.

b. Preparation of water resources management programs and action plans for water resources management in river basin

- Preparation of Annual Water Allocation Plans in Cisadane River
- *Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation*
- Water Quality Sampling and Analysis (3 times in one year)

d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources

- Revision of Water Allocation Plan, especially implementation of study on potential water supply for raw water to JABODETABEK, to re-allocate the water from irrigation water that intake from Katulampa weir. Because irrigation area is reduced
- Emergency Operation Plan of Situ Gintung
- Planning and Implementing levee (revetment) rehabilitation
- Detail Design of Rehabilitation for Situ (Small Dams)
- Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation
- Water Quality Sampling and Analysis (3 times in one year)

h. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- River Normalization and Channel Improvement in Ciliwung and Cisadane, and also Pesanggrahan, Angke, Sunter (PAS) Rivers. Additionally, short-cut at Kalibata and Kebun Baru of Ciliwung River
- Urban River Improvement at Cimanceuri, Cirarap, Cisadane, Cengkareng Drain, Kali Sabi, Kali Dadap, Grogol, Krukut, West Canal (Adem), Mampang, Cideng, Cipinang, Buaran, Jatikramat and Cakung, Blencong, Bekasi, Cikeas, Cileungsi, Cikarang, CBL, Cilemah Abang) with Flood Scale 1:25
- Preparation of Environment Conservation Strategy in Ciliwung River Basin and implementation of Environment Conservation Management, including National Movement of Partnership on Water Security (GNKPA) programs and activities

k. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin

- Implementation of Operation and Maintenance of Reservoirs (Situ), 60% of all Reservoirs in Ciliwung Cisadane River (other 40% reservoirs by local)
- Implementation of rehabilitation and O&M at 27 ponds
- Supervision, Inspection and Operation & Maintenance of Small Reservoirs (Situ) in Ciliwung Cisadane River Basin, especially inspection of Situ Gintung

n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)

- Implementation of Water Allocation Plan for Raw Water and detail design of facility especially check volume from Katulampa Weir for Irrigation
- Plan and Allocate for River Flushing with agreement with stakeholders
- Review and Water Allocation Plan in Cisadanr River for stakeholder's agreement
- Making Cooperation with stakeholders for Flood Management through TKPSDA
- Facilitation of National Movement of Partnership (GNKPA) for water security
- Preparation for technical recommendation on Water User Right (SIPPA)

Areas and concrete activity of capacity development for these priority issues is identified into several activities as below. Some of topics is related with other priority issues.

➤ **Irrigation water demand calculation at Cisadane Downstream**

An activity of **“Preparation of Annual Water Allocation Plans in Cisadane River”** in *b. preparation of water resources management programs and action plans for water resources management in river basin* is firstly identified as concrete activity for Water Allocation and Water Balance Calculation in Cisadane River. However, there are similar identified activities as follows;

- “Revision of Water Allocation Plan, especially implementation of study on potential water supply for raw water to JABODETABEK, to re-allocate the water from irrigation water that intake from Katulampa weir” [*d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources*]
- “Implementation of Water Allocation Plan for Raw Water and detail design of facility especially check volume from Katulampa Weir for Irrigation”
- “Review and Water Allocation Plan in Cisadanr River for stakeholder's agreement” [*n. Facilitation of Coordination Team of Water Resources Management at the river basin (TKPSDA)*]

These three topics are related into water allocation and re-calculation of irrigation water demands. As the result of discussion to make concrete work plan for the activity, JICA project should focus on the re-calculation of the irrigation water demand at Cisadane Downstream area where agriculture field is rapidly decreasing by industrial development and Soekarno Hatta International Airport Re-development. JICA Project will do;

- 1) Discussion on detail schedule of activity and collecting areal data
- 2) Check the Areal Data with Satellite and other data to find decreasing locations
- 3) Simple Survey at Site to identify current agriculture field area
- 4) Calculation of Irrigation Area on GIS
- 5) Re-calculation of Irrigation Water Demand for Cisadane Utara Irrigation Area

➤ **Environment Conservation at Upper Ciliwung**

An activity on “**Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation**” in [b. Preparation of water resources management programs and action plans for water resources management in river basin] is firstly identified as a concrete activity for Environment Conservation at Upper Ciliwung”. However, there are similar identified activities as follows;

- Survey/Investigation/Design of Check Dams for Ciliwung Upstream Conservation [d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources]
- Preparation of Environment Conservation Strategy in Ciliwung River Basin and implementation of Environment Conservation Management, including National Movement of Partnership on Water Security (GNKPA) programs and activities [h. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin]

These two topics are related into environment conservation for upstream of Ciliwung River. According to BBWS Ciliwung Cisadane, the BBWS has a project plan on development of “Situ Telaga Saat” at upper Ciliwung. as a result of discussion, the project at upper Ciliwung includes “Environment Conservation” as one of the purposes. Therefore, JICA project supports for the project at upper Ciliwung on environment conservation as Project Activity.

- 1) Site Survey to confirm current conditions of Situ Telaga Saat
- 2) Choosing adequate SAKURA for Situ Telaga Saat and survey availability of SAKURA
- 3) Introducing example of Environment Conservation Project in Japan
- 4) Discussion on concept and planning of the Project for making TOR of the Project

➤ **Operation & Maintenance of Dam (Situ) for safety**

An activity on “**Supervision, Inspection and Operation & Maintenance of Small Reservoirs (Situ) in Ciliwung Cisadane River Basin, especially inspection of Situ Gintung**” in [k. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin] is firstly identified as concrete activity for Operation and Maintenance of Dam (Situ) for safety. However, there are similar identified activities as follows;

- Emergency Operation Plan of Situ Gintung [d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources]
- Detail Design of Rehabilitation for Situ (Small Dams) [d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources]
- Implementation of Operation and Maintenance of Reservoirs (Situ), 60% of all Reservoirs in Ciliwung Cisadane River (other 40% reservoirs by local) [k. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin]
- Implementation of rehabilitation and O&M at 27 ponds [k. Water resources management which

includes water resources conservation and utilization as well as water damage control in the river basin]

These four topics are related into Operation & Maintenance for Dam Safety. According to BBWS Ciliwung Cisadane, Situ Gintung (dam) has a leakage from bottom of downstream side of spillway. BBWS will conduct an investigation/inspection survey. As the result of discussion to make concrete work plan for the activity, JICA project will support for the investigation/inspection survey at Situ Gintung for Dam safety, on

- 1) Condition check on leakage at Situ Gintung
- 2) Method of the inspection and analysis of leakage
- 3) Analysis of the survey result to find factor
- 4) Countermeasures and maintenance plan for the leakage problem

➤ **River Development (Normalization) in Ciliwung, Cisadane and other Rivers**

An activity on “**Planning and Implementing levee (revetment) rehabilitation**” in [d. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources] is firstly identified as concrete activity for River Normalization in Ciliwung, Cisadane and other Rivers. However, there are similar identified activities as follows;

- River Normalization and Channel Improvement in Ciliwung and Cisadane, and also Pesanggrahan, Angke, Sunter (PAS) Rivers. Additionally, short-cut at Kalibata and Kebun Baru of Ciliwung River [h. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin]
- Urban River Improvement at Cimanceuri, Cirarap, Cisadane, Cengkareng Drain, Kali Sabi, Kali Dadap, Grogol, Krukut, West Canal (Adem), Mampang, Cideng, Cipinang, Buaran, Jatikramat and Cakung, Blencong, Bekasi, Cikeas, Cileungsi, Cikarang, CBL, Cilemah Abang) with Flood Scale 1:25 [h. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin]

These two topics are related into River Normalization in Ciliwung, Cisadane and other Rivers. According to BBWS Ciliwung Cisadane, River Development Works, especially for flood control, was modified as river naturalization works which is based on request from DKI Jakarta. But the most difficult thing for the river works in Jakarta is that we cannot relocate houses in river area. Those houses in river area are officially illegal one. However, a judgement from Local Court said that Government should compensate for relocation even illegal house owner. BBWS will appeal against the decision from lower to higher court. Separately of the situation, BBWS would like to conduct River Normalization for Flood Control. JICA project might support for this matter with,

- 1) Introduction of Nature-Oriented River Works in Japan

- 2) Introduction of Urban River Flood Control Measures in Japan
- 3) On -site confirmation for feasibility on Naturalization of River and Flood Control in Urban River

Activity 1-5.

Make short- and middle- term CD plans to accomplish the capacity development recognized in “1-4” in the selected RBOs.

For accomplishment of CD recognized in Activity 1-4, it is a best way that project can implement a many activity to fulfill of CD for priority issues. However, the project should concentrate only several activities due to current resources of JICA experts and availability of member in BBWS Ciliwung Cisadane. Therefore, we, JICA project team and BBWS Ciliwung Cisadane agreed that we concentrate one activity for **“Irrigation water demand calculation at Cisadane Downstream”**.

Figure 2.1.1 shows CD plan until end of the project as a middle-term plan. Detail schedule and procedure for CD activity as a short-term plan is included into Figure 2.1.1 for implementation of CD activity as On the Job Training (OJT). Short- and middle- term CD plan are created through discussion between BBWS Ciliwung Cisadane and JICA project team.

However, during conducting OJT on “Irrigation water demand calculation at Cisadane Downstream”, priority of the activity topics had been changed, because of requests from stakeholders, policy changes and others. Therefore, Project Manager (PIU), BBWS Ciliwung Cisadane and JICA Project Team discussed to add OJT Topic as project activities after Training in Japan on 2018. Because new prioritized topics were included into topic of training in Japan on 2018, such as dam operation & maintenance at Miwa dam, Misogawa dam and Kuzuryu Dam and River Environmental Improvement at HIMEJI River and Highways Management Office of MLIT. JICA Project had conducted several activities with BBWS Ciliwung Cisadane for **“Environment Conservation at Upper Ciliwung”** and **“Operation & Maintenance of Dam (Situ) for safety”**, for examples following up of training in Japan on Dam Maintenance and introduction of environment Conservation Project in Japan.

PIU, BBWS Ciliwung Cisadane and JICA Project decided officially adding two topics as OJT topics, **“Environment Conservation at Upper Ciliwung”** and **“Operation & Maintenance of Dam (Situ) for safety”**, dropping one topic from OJT topic, **“Irrigation water demand calculation at Cisadane Downstream”**, at a meeting on 23rd October 2018.

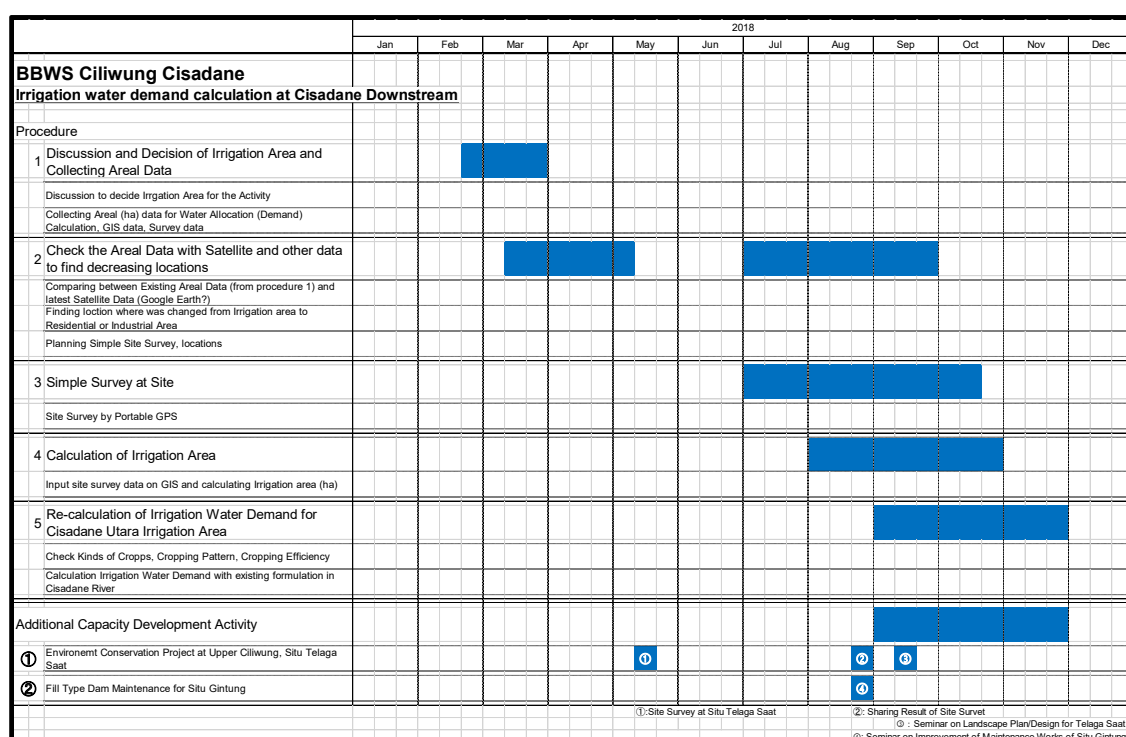


Figure 2.1.1 Revised CD plan including new OJT topics at BBWS Ciliwung Cisadane

Activity 1-6.

Carry out the capacity development activities* based on the CD plans and the work activities for the priority issues, in the selected RBOs.

JICA Project Team had conducted Capacity Development Activity as OJT with BBWS Ciliwung Cisadane. As mentioned above in Activity 1-5, the Project conducted several activities for topic of OJT “**Irrigation water demand calculation at Cisadane Downstream**” However, the Project added 2 topics of OJT, “**Environment Conservation at Upper Ciliwung**” and “**Operation & Maintenance of Dam (Situ) for safety**”. Table 2.1.13 shows a list of activities for Activity 1-6 at BBWS Ciliwung Cisadane.

Table 2.1.13 List of activities for Activity 1-6 at BBWS Ciliwung Cisadane

Topic	Date	Activity Type	Contents
OJT	Feb. 20, 2018	Meeting	- Explanation to New Head of BBWS - Discussion and Confirm on Activity 1-1 to 1-6 with Head of BBWS
OJT	March 14, 2018	Meeting	- Date Collecting on Water Allocation Planning Report at Cisadane River Through PIU Meeting
OJT	May 17, 2018	Meeting	- Check the existing report contents
Add. OJT (1)	May 17, 2018	Field Survey	- Site check at Situ Telaga Saat, upstream of Ciliwung River for Landscape Design and SAKURA Project

OJT	May 31, 2018	Meeting	- Confirm necessary data, if unavailable, we will conduct as an assumption calculation of Irrigation demands
OJT	Aug. 10, 2018	Meeting	- Explanation to New Head of BBWS - Additional topics for Project OJT
OJT	Beginning Aug. 2018		- Collecting the cultivation patter information from Kabupaten
Add. OJT (1)	Aug. 28, 2018	Meeting	- Confirm procedure and schedule of activity for Environment Conservation Project
Add. OJT (2)	Aug. 30, 2018	Seminar	- Discussion on Maintenance work for Situ Gintung (Rock-Fill Type Dam) - Site check on water leakage at downstream of Dam body
Add. OJT (1)	Aug. 31, 2018	Field Survey	- Check the available SAKURA for Telaga Saat at Cibodas Botanical Garden
Add. OJT (1)	Sept. 14, 2018	Seminar	- Head of BBWS chaired for the Seminar - Discussion on Concept and Kinds of SAKURA for Telaga Saat
Add. OJT (1)	Oct. 4, 2018	Seminar	- Introduction on River Works with Nature Conservation - Discussion on River Works without relocation of houses at river
OJT	Oct. 11, 2018	Discussion	- Self-Assessment Report of 2017 - Upgrading the Report Contents, especially "Action Plan"

The Project had conducted several kinds of activities, such as meetings. Seminar and Field Survey. Several activities are described in detail as follows.

➤ **Field Survey for Additional OJT 1 (Environment Conservation at Upper Ciliwung) on 17th May 2018**

Participants:

BBWS Ciliwung Cisadane: Mr. Rian, Mr. Hamdin, Mr. Cecep

JICA Project: Mr. MIURA, Mr. Sarwono, Mr. Laode

Schedule:

Depart form BBWS Ciliwung Cisadane Office

Arrive at Situ Telaga SAAT

Arrive at Telaga Warna

Return at BBWS Ciliwung Cisadane

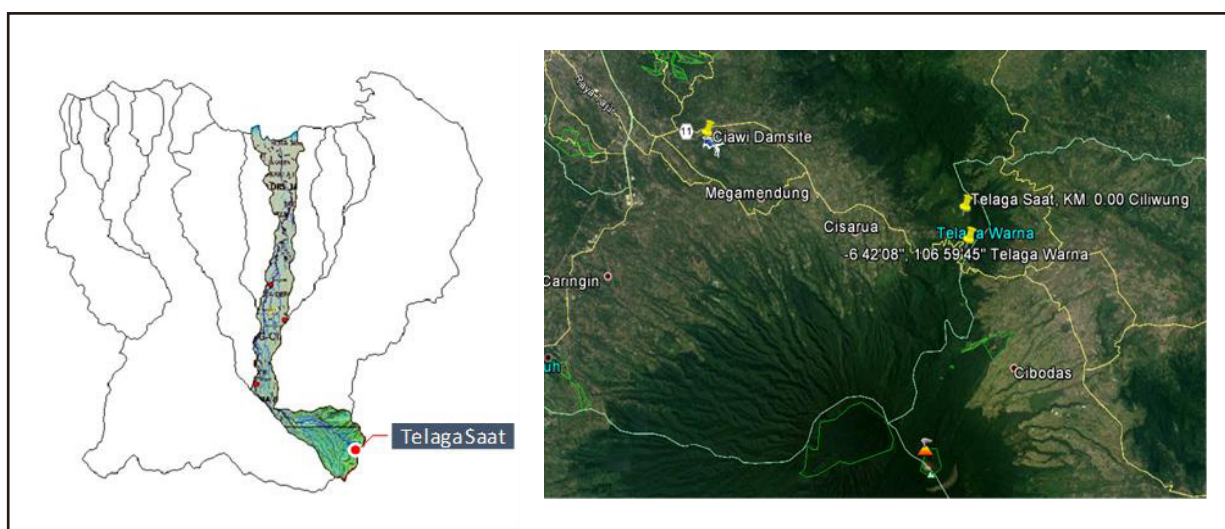


Figure 2.1.2 Location Maps of Field Survey to Situ Telaga Saat with BBWS Ciliwung Cisadane

[Situ Telaga Saat]

- ✓ Original Flow of Ciliwung River into the Situ Telaga Saat
- ✓ It was a natural lake. But it was upgraded as Situ
- ✓ As of morning 17th May 2018, water color is brawn, it caused by rain yesterday and early morning
- ✓ Basically, water quality is clean, original flow of Ciliwung River is also clean
- ✓ There is water weed in the Situ. It grows on the bottom of lake and floating sand and plant's roots
- ✓ Water weed may not be created by nutrients from original flow and tea plantation. Therefore, eutrophication in the Situ will not be happened
- ✓ We can see landslides on the slope at upstream of the Situ. The Slope on a mountain is steep. And condition of surface geology is not so stable.

But access road to the Situ is too narrow to bring equipment. Therefore, we should accept using small equipment to excavate just only



Photo 2.1.1 Situation of Upper Ciliwung at Telaga Saat and Field Survey with BBWS Ciliwung Cisadane

Upper Left: Explanation Board on Situ Telaga Saat, **Upper Right:** Checking the conditions of sites, **Middle Left:** At upstream of Situ, there are some landslides. We should consider it into Environment Conservation Plan, **Middle-Right:** Near the Situ, a special eagle habitat. It also should be considered into the Plan, **Lower:** Current Situation of the Situ

➤ **Seminar for Additional OJT 1 (Operation & Maintenance of Dam (Situ) for safety) on 30th August 2018**

Participants:

BBWS Ciliwung Cisadane: Division of O/M, Sakter O/M, Total 13 Officials

JICA Project: Mr. MIURA, Mr. Sarwono

Agenda:

Purpose of the Seminar:

Mr. Rian, Manager of Sakter (Project Unit) O/M

Current Situation of Situ Gintung:

Leader of Operators at Situ Gintung

Examples of Dam Maintenance in Japan:

Mr. MIURA Hirohisa, JICA Expert

Suggestions and Conclusions :

Ms. Suzanti, Head of O/M Division

Result:

- ✓ There is leakage at downstream side of spillway that is at center of dam body
- ✓ According to the operator, the leakage comes from foundation of dam body as “Spring”
- ✓ There is no leakage (seepage) from dam body
- ✓ Therefore, most possible factor of leakage is the leakage from foundation
- ✓ BBWS Ciliwung Cisadane will conduct a Geodetic Sonar Survey to check detail condition of foundation and Spring
- ✓ JICA Project will support of the Survey and data analysis for making countermeasure against leakage
- ✓ Also, JICA Project provided examples of maintenance check list of Fill-Type Dam in Japan



Photo 2.1.2 Seminar on Maintenance Works of Situ Gintung by BBWS Ciliwung Cisadane

Left: Ms. Suzanti, Head of O/M Division of BBWS Ciliwung Cisadane is explaining on key point on dam maintenance, **Right:** Mr. MIURA, JICA Project Expert, is introducing the maintenance check list of Fill Type Dam in Japan:



Photo 2.1.3 Situation of Situ Gintung, especially leakage and seepage

Upper Left: View from Downstream side to Dam Body. Regarding Leakage from bottom of spillway, we cannot confirm the leakage virtually on 30th August 2018, **Upper Right:** Situation of Seepage on downstream slope of dam body **Lower Left:** Drain pipes for leakage/seepage. As of 30th August, there is no water from pipes. Water comes joint of concrete structure, **Lower-Right:** V-Notch for leakage/seepage volume observation is available

➤ **Seminar for Additional OJT 2 (Environment Conservation at Upper Ciliwung) on 14th September 2018**

Participants:

BBWS Ciliwung Cisadane: Head of BBWS Ciliwung Cisadane, Sakter O/M, Total 13 officials

JICA Project: Mr. MIURA, Mr. Sarwono

Agenda:

Opening Remarks: Mr. Bambang, Head of BBWS Ciliwung Cisadane

Progress of the Environment Conservation Project at Ciliwung:

Mr. Rian, Manager of Sakter (Project Unit) O/M

Examples of Environment Conservation Project in Japan:

Mr. MIURA Hirohisa, JICA Expert

Suggestions and Conclusions:

Mr. Bambang, Head of BBWS Ciliwung Cisadane

Result:

- ✓ Mr. MIURA emphasized that concept and zoning is essential for landscape planning and design. And he introduced examples of 1) Small stream constructed by natural stones, 2) Eco-friends and education facilities
- ✓ Mr. Sarwono, JICA Project Local expert, proposed landscape design that includes SAKURA trees planting
- ✓ Mr. Bambang indicated BBWS Ciliwung Cisadane should make concept and landscape design that is considered comments from participants and examples/proposal from JICA project



Photo 2.1.4 Seminar on Environment Conservation and development Project at Telaga Saat at BBWS Ciliwung Cisadane on 14 Sept. 2018

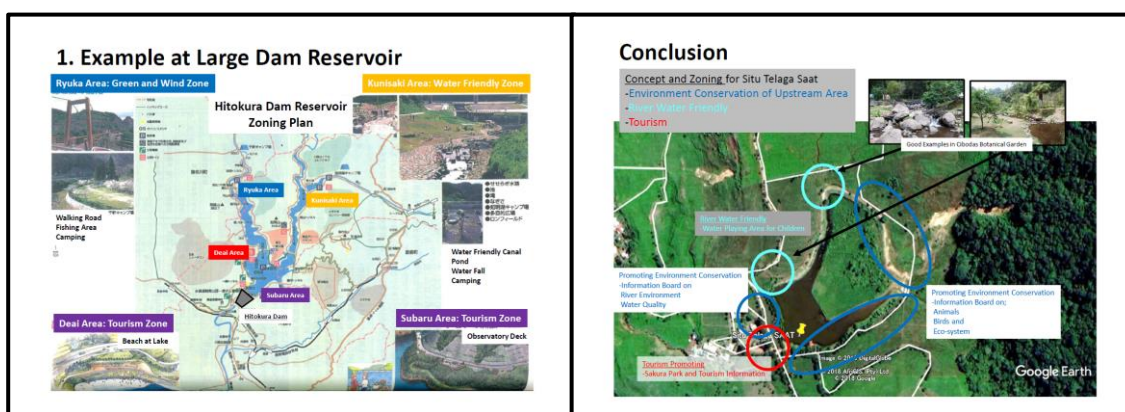


Figure 2.1.3 Example of Dam Reservoir Conservation and Development in Japan and proposal of concept and zoning of Telaga Saat in Mr. MIURA's presentation

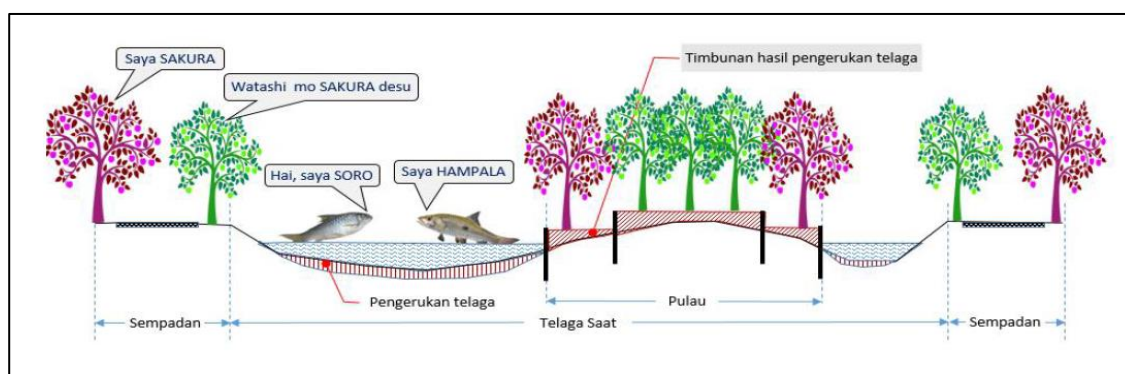


Figure 2.1.4 Proposed Cross Section Plan of Telaga Saat development project from JICA Project

Activity 1-7.

Evaluate regularly the capacity of the RBOs through the progress on implementation of CD plans including the trainings, and the daily work activities to the priority issues, by various methods such as interviews to the staff, existing RBO benchmarking indicators and job assessment.

Regular evaluation of capacity of RBOs has been conducted by all BBWS and BWS, including BBWS Ciliwung Cisadane, as a “Performance Assessment” in the Benchmarking. BBWS Ciliwung Cisadane has conducted “Self-Assessment of Performance” every year. JICA Project used their result of Self-Assessment for Activity 1-7. And JICA Project supported for upgrading the report of Self-Assessment of Performance. Table 2.1.14 shows Benchmarking Scores of BBWS Ciliwung Cisadane.

Table 2.1.14 Benchmarking Scores of BBWS Ciliwung Cisadane

Year	2015	2016	2017	2018
Benchmarking Score	2.60	3.03	3.00	3.17

JICA Project support for upgrading the Self-Assessment Report in 2017 of BBWS Ciliwung Cisadane. Result Summary of Assessment is shown on Table 2.1.15.

Table 2.1.15 Summary of Benchmarking Score of BBWS Ciliwung Cisadane on 2017

No.	Indicators	Score 2017	
		SA	Review
	Mission		
1	Status of SDA Management Institution	3.5	3.5
2	Governance of Water Resources	3.5	3.5
	Stakeholders		
3	Involvement of Water Users	3.5	3.5
4	Feedback from Water Users	2.0	2.0
5	Environmental Audit	2.5	2.5
6	Decent Living Standards in Related River Basins	3.5	3.5
	Learning and Growth		
7	Human Resources Development	3.5	3.5
8	Technical Development	3.0	3.0
9	Development of Water Resources Managing Institution	2.5	2.5
	Internal Organizational Governance		
10	Governance Planning in SDA Management Institution	4.0	4.0
11	Utilization of WR, Water Allocation, Drought & Licensing	3.0	3.0
12	Control of Water Damage	3.0	3.0
13	Data (SISDA) Processing	3.0	3.0
	Finance		
14	Cost Recovery	3.5	3.5
15	Financial Efficiency	1.0	1.0
	Total Score	45.0	45.0
	Average Score for Each Indicator	3.0	3.0

Activity 1-8.

Consolidate good or bad practices, lessons and challenges learnt through the field practices, based on the output of “1-7”.

The Report on Performance Assessment of Benchmarking usually describes “Action Plan”. It mentions about necessary efforts and program that will be conducted for the improvement of the performance toward to target score. The efforts and program include several challenges that are reflected from working experiences as good or bad practices. Therefore, it can be said that efforts and program in “Action Plan” are consolidated practices, lessons and challenges for capacity development.

The challenges that are related with JICA Project’s OJT Topics is mentioned with descriptions of the Benchmarking Report as followings.

➤ **Environment Conservation of Upper Ciliwung**

Indicator No.5: Environmental Audit

- 2) Conducting environmental studies and monitoring

➤ **Dam Operation & Maintenance for Safety**

Indicator No.2: Governance of Water Resources

- 3) Arranging Infrastructure Management for Situ

Indicator No.8: Technical Development

- 4) Planning short and long-term maintenance of assets and infrastructure for OP River activities, East Flood Canal OP, West Flood Canal OP and OP situ,

Indicator No.11: Utilization of Water Resources, Water Allocation, Drought and Licensing

- 1) Technical Audit of raw water, situ and dam
3) Comprehensive inspection of Gintung dam.
4) Regular maintenance of situ in the Ciliwung Cisadane river area

Activity 1-9.

Improve each CD plans, considering the output of 1-8, and carry out the revised plans in the selected RBOs.

At BBWS Ciliwung Cisadane, JICA Project had considered latest issues on Water Resources Management in Ciliwung Cisadane River Basin. The Basin has most developed area in Indonesia, DKI Jakarta, West Java Province and Banten Province, and there are a lot of stakeholders. Moreover, Governor of DKI Jakarta has been changed by the election on April 2017. Policy for Water Resources Management also has been changed.

Therefore, on July 2018, DKI Jakarta would like to have new project to improve river channel with

“Naturalization” at urban rivers in Jakarta. BBWS Ciliwung Cisadane has been requested cooperation with DKI Jakarta to implement the new Project on “Naturalization”. Therefore, JICA Project revised CD plans at BBWS Ciliwung Cisadane to add “Environment Conservation at Upper Ciliwung” as new OJT topic to match with latest condition of Water Resources Management in Ciliwung River Basin. Actually, this issue is mentioned on result of Activity 1-8.

Regarding on “Operation & Maintenance of Dam (Situ) for safety”, JICA Project revised CD plan to add new OJT topic. BBWS Ciliwung Cisadane found leakage on foundation at downstream side of spillway and continued monitoring its situation. The leakage has not stopped until 2018. And some officials at BBWS Ciliwung Cisadane participated in Training in Japan by JICA Project in 2016, 2017 and 2018. The Participants could collect examples and technical information for Fill-Type Dam Safety Management, especially periodical maintenance check. Therefore, JICA Project would support for “Operation & Maintenance of Dam for Safety” to introduce technical examples in Japan and support for making a countermeasure against the leakage. Actually, improvement of Dam Operation & Maintenance is mentioned at the result of Activity 1-8.

2) BWS Sulawesi I

Activity 1-1.

Analyse and break down the expected RBO’s functions and roles into daily work activities.

Activity 1-1 is divided into 2 (two) portions for effective analyze and break down, 1) Analyze the expected RBO’s functions and roles, 2) Break down daily work activities of expected functions and roles.

● Analyse the expected RBO’s functions and roles

<< Methodology of Analysis on expected RBO’s function >>

Functions / roles on Water Resources Management have been described by a Ministerial Regulation; however, priority items have not been identified. Therefore, proposal on priority items as expected functions and roles should be analyzed by collected information. The analysis result is confirmed at discussion with BWS Sulawesi I.

Analysis has been conducted in 3 (three) steps as in below box;

Step 1: Comparing between current functions and various items

Step 2: Integrating result of above “Step1” to find candidate expected functions and roles as proposal

Step 3: Discussion to decide expected functions and roles

<< (Step 1) Comparing between current functions and various items >>

✓ Current functions

Current functions of BBWS and BWS is mentioned on Ministerial Regulation No.34/PRT/M/2015 (No. 21/PRT/M/2010). The functions are common one among all BBWS and BWS in Indonesia.

On the other hands, result of Output 1 will be reflected to activities of Output 2. Activity of Output 2 is for all BBWS and BWS. It is effective and understandable, if we use common functions between output 1 and output 2 as indicators on CD activities.

Therefore, we decided functions and roles on No.34/PRT/M/2015 (No.21/PRT/M/2010) as current functions and roles for this analysis.

[Reference] Relation and reflection between outputs 1 to output 2

- (1) *Outputs of activities 1-1 and 1-2 will be reflected to activity 2-5 on evaluation of capacity of RBOs and improvement of benchmarking mechanism*
- (2) *Outputs of activities from 1-3 to 1-9 as "Field Practice" will be considered into activity 2-3 on making and carrying out short- and mid-term plans of CD activities*

Current Functions and Roles for analysis of output 1*

- a. Compilation of the pattern and plan of water resources management in the river basin;
- b. Compilation of program and plan, feasibility study and planning of technical/design/development of water resources;
- c. Preparation, compilation of plan and document of goods and services procurement;
- d. Implementation of goods and services procurement as well as determination of the winner (winner of the tender) as a Procurement Service Unit (ULP);
- e. Control and supervision of construction of water resources development;
- f. Compilation of plan and implementation of the management of protected water source area in the river basin;
- g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin;
- h. Hydrology system management;
- i. Water resources information system management;
- j. Implementation of O&M of water resources in the river basin;
- k. Implementation of technical guidance for water resources management under the authority of province and regency/city;
- l. Preparation of technical recommendation for granting permission on supply, allocation, utilization and exploitation of water resources in the river basin;
- m. Facilitation of the activity of Coordination Team of Water Resources Management in the river basin;
- n. Public empowerment in the water resources management;
- o. Implementation of compilation of financial accounting and state property accounting report as a Regional Accounting Unit;
- p. Implementation of collection, reception and usage of water resources management service fee (BJPSDA) in accordance with the provisions of legislation; and
- q. Implementation of administration and housekeeping affair of the BBWS as well as coordination with related institution.

**from No.34/PRT/M/2015 (No.21/PRT/M/2010) (English translation is unofficial)*

✓ **Information for the Analysis**

The project team received draft RENCANA, Assessment Report and Accountability Report during Needs Survey from BWS Sulawesi I as information for the analysis. And also, the project was suggested that capacity of BBWSs and BWSs should be improved to same level of PJT I and II.

Therefore, various items of below are used for analysis.

Information for the Analysis

- (1) Draft RENCANA on TONDANO-SANGIHE-TALAUD-MIANGAS RIVER BASIN
- (2) Draft RENCANA on Dumoga Sangkub River Basin
- (3) Peer Review Report of Performance Assessment of BWS Sulawesi I (Aug. 2013)
- (4) Accountability Report, Fiscal Year 2014 of BWS Sulawesi I
- (5) Functions and Roles of PJT I and II

✓ **Comparing between Current Functions / Roles and Various Items**

Table 2.1.16 shows 5 (five) items as information for the analysis, information sources and results of our analysis to find candidate current functions as expected functions / roles. We have picked up much information from each item as important / prioritized / necessary / recommended works to put on adequate current functions / role. Then, to find expected functions / roles, we put value on each current function accordance with each criterion, such as number of works, score gap between current and goal of Performance Assessment, etc.

Table 2.1.16 Items for analysis to identify expected functions and roles of BWS Sulawesi I

No	Item	Information Source	Analyzed Result
(1)	RENCANA (Tondano-Sangihe-Talaud-Miangas)	Physical and Non-Physical Efforts	Important Functions with Detail Works
(2)	RENCANA (Dumonga Sangkub)	Physical and Non-Physical Efforts	Important Functions with Detail Works
(3)	Assessment (Benchmarking) Report	Recommendations and Score	Prioritized Functions with Detail Works
(4)	Accountability Report	Things that are needed to improve performance, completed and continue activity	Necessary Works and Performance
(5)	Self-Assessment Report and Company Profile of PJT1 and 2	Function and Duty of PJT1 and 2	Recommended Function and Duty

- (Step 2) Integrating result of above “Step1” to find candidate expected functions and roles (Duties) as proposal

Table 2.1.17 shows integrating analyzed result of “Comparing between current functions / roles and various items” from each analysis and describes total score and candidate current functions as expected functions / roles.

Table 2.1.17 Integrating analyzed result and total score of BWS Sulawesi 1

No.	Current Functions	RENCANA (TODANO-SANGHE- TALAUDAMANGAS)	RENCANA (Dumoga Sungkub)	Assessment Report	Accountability Report	PJT I and II	Total	
a	Compilation of Pattern and Plan of WRM	Middle	Low	Middle	Low		Low	6
b	Program, Plan, FS of WRM	Middle	High	Middle	Middle	Low	Middle	10
c	Plan and Document of procurement	Low	Middle	Low	Low	Low	Low	6
d	Implementation of Procurement	Low	Middle	Low	Low	Low	Low	6
e	Control and Supervision of Construction	High	High	Low	Middle		Middle	9
f	Management of Protected area	High	High	Low	Low	Middle	Middle	10
g	WRM, Conservation, Utilization, Damage Control	High	High	High	High	High	High	15
h	Hydrology System	Middle	High	High	Middle	Middle	High	12
i	WR Information System	High	High	High	Middle	Middle	High	13
j	O/M of WR	Middle	High	Middle	Middle	High	High	12
k	Technical Guidance to Authority	Middle	High	Low	Low	Low	Middle	8
l	Technical Recommendation for Permission	Middle	High	Middle	Low		Middle	8
m	WRM Coordination Team	High	High	Middle	High	Low	High	12
n	Public Empowerment	High	High	Low	Low	Middle	Middle	10
o	Financial and Property Accounting Report	Low	Middle	Low	Low		Low	5
p	BJPSDA	Middle	Middle	Middle	Low	High	Middle	10
q	Administrative and general affairs	Low	Low	Low	Middle	High	Middle	8

Criteria: Total is 12 and more "High"

Point Distribution: High 3, Middle 2, Low 1

Total is from 8 to 11 "Middle"

Total is 7 and less "Low"

According to total score on Table 2.1.17, candidate functions as expected functions / roles are recognized temporarily into 5 (five) functions as below box;

Temporary expected functions / roles

- g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin;
- h. Hydrology system management;
- i. Water resources information system management;
- j. Implementation of O&M of water resources in the river basin;
- m. Facilitation of the activity of Coordination Team of Water Resources Management in the river basin;

<< (Step 3) Discussion to decide expected functions and roles >>

From BWS Sulawesi I

- Current Functions are acceptable, because from Ministerial Regulation
- Recognized 5 (five) expected functions / roles are acceptable as temporary one
- Information from one more RENCANA should be included

From Sub-Directorate of Water Resources Institutions, DGWR, PUPR

- Works on procurement and finance should be surveyed to consider for the analysis

<<Confirmed expected functions in BWS Sulawesi I>>

Confirmed expected functions / roles

- g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin;
- h. Hydrology system management;
- i. Water resources information system management;
- j. Implementation of O&M of water resources in the river basin;
- m. Facilitation of the activity of Coordination Team of Water Resources Management in the river basin;

● **Break down daily work activities of expected functions and roles**

<< Methodology of breakdown of daily and important activities on expected RBO's function >>

In the analysis at Activity 1-1, important / prioritized / necessary / recommended works already picked up from each item such as draft RENCANA, Assessment Report, Accountability Report and PJT functions, and put on adequate current functions. Therefore, candidate daily / important works for expected functions / roles can be sorted out and we choose suitable daily / important works and break down into details on daily activities and important duties.

Step 1: Sort out detail duties from bellows for analyzed expected functions

1) RENCANA, 2) Assessment Report, 3) Accountability Report, 4) PJT functions

Step 2: Break down of daily activity for detail duties

<< (Step 1) Sort out detail duties from 1) RENCANA, 2) Assessment Report, 3) Accountability Report and 4) PJT function and roles, for analyzed expected functions >>

Detail Duties from RENCANA, Assessment Report, Accountability Report and PJT functions are sorted out and classified as candidate daily / important works for expected functions / roles.

Table 2.1.18 to Table 2.1.22 show candidate daily / important works for each expected functions / roles.

Table 2.1.18 Candidate daily / important works for expected functions / roles of “g.”

g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin	
RENCANA	
	Water Quality Monitoring at Rivers (add test equipment BOD, COD)
	Development and Improvement of Drinking Water
	Planting Mangrove for coastal protection
	Early flood warning system and evacuation route
	Maintain ground water resources
Assessment Report	
	Water Quality; human resource development and monitoring point
	Improve raw water facility and infrastructure
Accountability Report	
	Disaster Management (Flood Control, landslide, tidal wave and coastal protection)
PJT Functions	
	Flood Control
	Supply water for daily needs
	Water resources conservation
	Maintenance of facility and infrastructure

Table 2.1.19 Candidate daily / important works for expected functions / roles of “h.”

h. Hydrology System Management	
RENCANA	
	Rehabilitation and repair of hydro meteorological station
	Construction of telemeter system for of rain and water level
Assessment Report	
	Procurement of ARR logger and AWLR logger
Accountability Report	
	Activity of Hydrology Unit
PJT Functions	
	Management of Hydro meteorological and water quality data

Table 2.1.20 Candidate daily / important works for expected functions / roles of “i.”

i. Water resources information system management	
RENCANA	
	Development and update of information system and its database
	Socialization of information system with stakeholders
Assessment Report	
	Formulation of WR Information System Unit
	Quality Control of data for publication
	Provision of Internet service to be accessibly for public, especially community
Accountability Report	
	Activity of SNVT implementation of water resources network Sulawesi I
PJT Functions	
	Dissemination of monitoring and evaluation of water quantity and quality to water users and community

Table 2.1.21 Candidate daily / important works for expected functions / roles of “j.”

j. Implementation of O&M of water resources in the river basin
RENCANA
Improvement of WR facility and infrastructure O/M
O/M of sedimentation
Rehabilitation and repair of riverbank protection
Assessment Report
Implementation of asset management for WR facility and Infrastructure
Applying SOP for O/M
Accountability Report
Activity of SNVT O/M
PJT Functions
Implementation of routine, periodic, minor repair and emergency O/M for WR facility and infrastructure
O/M for Safety for WR facility and infrastructure and secure of WR

Table 2.1.22 Candidate daily / important works for expected functions / roles of “m.”

m. Facilitation of the activity of Coordination Team of Water Resources Management
RENCANA
Improvement of institution and function of P3A
Smooth implementation of construction of Kuwil Dam and Laule retention area
Settlement of potential conflict between stakeholders in Pulau Bangka area
Assessment Report
Immediately activate of function and duty of coordination team refer to Presidential Decree No.12 / 2012 and Ministry of PUPR's regulation No.4 / 2008
Accountability Report
Coordination with relevant agencies has to be done before implementation of activity
Activity of TKPSDA for Tondano – Sangihe – Talaud - Miangas river basin, TKPSDA for Dumoga - Sangkub river basin
PJT Functions

<< (Step 2) Discussion for confirmation of daily and important activities >>

The project team had discussion with BWS Sulawesi I to confirm of daily / important activities (works). We got new ideas and revisions of candidate daily / important activities for each expected functions / role as below;

- g. Water resources management which includes water resources conservation and utilization as well as water damage control in the river basin
 - Candidates are suitable as daily / important activities
 - As an additional information, BWS Sulawesi I will establish small laboratory on water quality analysis
 - BWS Sulawesi I struggle on checking plan / design of coastal protection infrastructures because there is no practical / technical standard and guideline
- h. Hydrology system management
 - Candidates are suitable as daily / important activities

- It is also important for BWS Sulawesi I to cooperate with Meteorological Agency and Agricultural Agency to share hydro meteorological data
- i. Water resources information system management
 - Candidates are suitable as daily / important activities
 - It is also important for BWS Sulawesi I to develop human resource for operation of GIS software
- j. Implementation of O&M of water resources in the river basin
 - Candidates are suitable as daily / important activities
 - As an additional information, BWS Sulawesi I conducts O/M of groundwater intake facility
- m. Facilitation of the activity of Coordination Team of Water Resources Management in the river basin;
 - Candidates are suitable as daily / important activities
 - Coordination on Water Allocation of Lolak Dam is included river maintenance flow
 - Necessary efforts on RENCANA are been selecting with TKPSDA (Coordination team)
 - BWS Sulawesi I coordinates a variety of issues on planning / construction / O/M with TKPSDA

<< Confirmed daily and important activities >>

g. WRM which includes Conservation, Utilization, Damage Control

Flood Management

- Implementation of Flood Control Project
- Rehabilitation and repair Early Warning System
- Flood Hazard Mapping and support for arrangement of evacuation sites and routes
- Flood Management Planning on preparation, response and operation and rehabilitation with stakeholders

Water Quality Management

- Sampling 2 times/1 years, at 67 points
- Analyzing 15 parameters and data management
- Patrol rivers and lakes (periodically and emergency)
- Sharing water quality situation with stakeholders and water users
- Utility of Small laboratory, equipment and human development

Coastal Protection

- Implementation coastal protection construction works (check design, quality control of construction works)
- Evaluation of existing structures, including impact to residence and fishery
- Coordination of planting and conservation of mangrove
- Patrol coastal area and Maintenance of existing structures

h. Hydrology System Management

- Evaluation of hydro-meteorological observation station network
- Rehabilitation and repair equipment to be able to measure flood situation
- Flow measurement (low and high water) and update H-Q formulation
- Patrol and data collection
- Maintenance of building, equipment (Periodically and emergency)
- Human resource development of technician on electric and telecommunication equipment
- Survey Cross Section at River and Sedimentation in Reservoirs

i. Management of Water Resources Information System (SISDA)

- Data collection and management on 1) Hydrology (Water Level, Flow rate),
2) Meteorology (Rainfall), 3) Water quality (15 parameters),
4) Infrastructures, with GIS system
- Update format for easy input to SISDA

j. Operation and Maintenance of Water Resources

- Update, formulation and implementation of O/M rule of water resources facilities and infrastructures
- Patrol and maintenance of facilities and infrastructures, such as Sabo dam and Check dam, Irrigation (4 areas), Coastal protection (revetment, sea wall)
- Planning maintenance and rehabilitation, considering with assets management
- Low water management (Water distribution, river maintenance flow)
- High water management (flood control operation with stakeholders, especially hydropower sector)
- Sediment Management (Survey of Cross Section at River and Reservoirs)

m. Facilitate of Activity of Coordination Team for WRM

- Management of TKPSDA team's activity as secretariat
- Coordination for dam project
- Coordination on water allocation/distribution plan for dam project
- Formulation of "RENCANA PENGELOLAAN SUMBER DAYA AIR WILAYAH SUNGAI"
(TONDANO-SANGIHE-TALAUD-MIANGAS RIVER BASIN)
(Dumoga Sungkub River Basin)
- Plan-Design-Construction-Operation/Maintenance of each projects

Activity 1-2.

Identify current functions and roles, and the actual daily work activities of several RBOs, and sort out the activities to be strengthened by comparing the actual activities with the ideal functions and roles mentioned above in 1-1.

Through discussion between BWS Sulawesi I and JICA project team, activities to be strengthened had been

sorted out as below;

g. WRM which includes Conservation, Utilization, Damage Control

Flood Management

- Rehabilitation and repair Early Warning System

Water Quality Management

- Sharing water quality situation with stakeholders and water users
- Utility of Small laboratory, equipment and human development

Coastal Protection

- Evaluation of existing structures, including impact to residence and fishery

h. Hydrology System Management

- Rehabilitation and repair equipment to be able to measure flood situation
- Flow measurement (low and high water) and update H-Q formulation
- Human resource development of technician on electric and telecommunication equipment
- Survey Cross Section at River and Sedimentation in Reservoirs

i. Management of Water Resources Information System (SISDA)

- Data collection and management on 1) Hydrology (Water Level, Flow rate),
2) Meteorology (Rainfall), 3) Water quality (15 parameters),
4) Infrastructures, with GIS system
- Update format for easy input to SISDA

j. Operation and Maintenance of Water Resources

- Update, formulation and implementation of O/M rule of water resources facilities and infrastructures
- Low water management (Water distribution, river maintenance flow)
- High water management (flood control operation with stakeholders, especially hydropower sector)
- Sediment Management (Survey of Cross Section at River and Reservoirs)

m. Facilitate of Activity of Coordination Team for WRM

- Management of TKPSDA team's activity as secretariat
- Formulation of "RENCANA PENGELOLAAN SUMBER DAYA AIR WILAYAH SUNGAI"
(TONDANO-SANGIHE-TALAUD-MIANGAS RIVER BASIN)
(Dumoga Sungkub River Basin)
- Plan-Design-Construction-Operation/Maintenance of each projects

Activity 1-3.

Identify priority issues, which are necessary to be tackled with stakeholders as common and important targets, in the selected RBOs as pilot fields.

Priority issues which are necessary to be tackled with stakeholders are selected from result of Activity 1-2 “activities to be strengthened” as below. The issues are selected by discussion with PUPR, BWS Sulawesi I.

g. WRM which includes Conservation, Utilization, Damage Control

Flood Management

- Rehabilitation and repair Early Warning System

Water Quality Management

- Sharing water quality situation with stakeholders and water users

Coastal Protection

- Evaluation of existing structures, including impact to residence and fishery

h. Hydrology System Management

- Human resource development of technician on electric and telecommunication equipment

i. Management of Water Resources Information System (SISDA)

- Data collection and management on 1) Hydrology (Water Level, Flow rate),
2) Meteorology (Rainfall...), 3) Water quality (15 parameters),
4) Infrastructures, with GIS system

j. Operation and Maintenance of Water Resources

- Update, formulation and implementation of O/M rule of water resources facilities and infrastructures
- Low water management (Water distribution, river maintenance flow)
- High water management (flood control operation with stakeholders, especially hydropower sector)

m. Facilitate of Activity of Coordination Team for WRM

- Management of TKPSDA team’s activity as secretariat
- Formulation of “RENCANA PENGELOLAAN SUMBER DAYA AIR WILAYAH SUNGAI”
(TONDANO-SANGIHE-TALAUD-MIANGAS RIVER BASIN)
(Dumoga Sungkub River Basin)
- Plan-Design-Construction-Operation/Maintenance of each projects

Activity 1-4.

Identify concrete work activities to tackle the priority issues recognized in “1-3”, and area of the capacity development necessary for those work activities in the selected RBOs.

Through discussion between BWS Sulawesi I and JICA Project Team, the priority issues to formulate concrete work activities are selected from the result of Activity 1-3. However, some of the priority issues are raised from the result of Activity 1-2, about hydrology management. Observation of river water level and rainfall can be conducted by BWS Sulawesi I, but hydrological data and information is a basis of almost all activity on water resources management including stakeholder coordination. This is why we include “Hydrology

management” as priority issues even the topic is not included in the result of Activity 1-3.

g. WRM which includes Conservation, Utilization, Damage Control

Flood Management

- Rehabilitation and repair Early Warning System

h. Hydrology System Management

- Rehabilitation and repair equipment to be able to measure flood situation
- Flow measurement (low and high water) and update H-Q formulation
- Human resource development of technician on electric and telecommunication equipment
- Survey Cross Section at River and Sedimentation in Reservoirs

i. Operation and Maintenance of Water Resources

- Update, formulation and implementation of O/M rule of water resources facilities and infrastructures
- Low water management (Water distribution, river maintenance flow)
- High water management (flood control operation with stakeholders, especially hydropower sector)

m. Facilitate of Activity of Coordination Team for WRM

- Plan-Design-Construction-Operation/Maintenance of each projects

Areas and concrete activity of capacity development for these priority issues is identified into several activities as below. Some of topics is related with several priority issues. For examples;

An activity of “Conduct flow observation and update H-Q formulation of high water for warning System” is firstly identified as concrete activity for Flow measurement (low and high water) and update H-Q formulation in **h. Hydrology System Management**. However, flow measurement is contributed to flood warning system. Because, a master plan on flood management has been created by JICA Sector Loan Project (IP-555). In the plan, flood control plan is based on “flood discharge”, it is written as a river flow volume. And new dam, Kuwil and Lolak, will be constructed and start operation. Discharge from dam is indicated by flow volume. Therefore, flow measurement and update H-Q formulation that can make conversion between river water level and river flow rate is essential for rehabilitation for flood warning system. So, the topic is also identified as concrete activity for Rehabilitation and repair Early Warning System for **Flood Management** at **g. WRM which includes Conservation, Utilization, Damage Control**.

Table 2.1.23 shows concrete activities for priority issues that are identified above.

Table 2.1.23 Concrete activity as “Activity” for priority issues

Topic	Activity
Water Resources Management which includes Conservation, Utilization and Damage Control	
Flood Management	
	Rehabilitation and repair Early Warning System
	<i>Conduct flow observation and update H-Q formulation of high water for warning System</i>
	<i>Update/create maintenance manual and conduct maintenance work of hydrological equipment for warning system</i>
	<i>Flood Hazard Mapping</i>
Water Quality Management	
	Sharing water quality situation with stakeholders and water users
	Utility of Small laboratory, equipment and human development
	<i>Create manual of patrol and implement patrol</i>
	<i>Create potential hazard and risk map of water quality</i>
Coastal Protection	
	Evaluation of existing structures, including impact to residence and fishery
	<i>Create technical manual for structural design of coastal protection</i>
Hydrology System Management	
	Rehabilitation and repair equipment to be able to measure flood situation
	<i>Improve maintenance work of hydrological equipment</i>
	Flow measurement (low and high water) and update H-Q formulation
	Human resource development of technician on electric and telecommunication equipment
	Survey Cross Section at River and Sedimentation in Reservoirs
	<i>Improve maintenance work of hydrological equipment</i>
	<i>Improve flow observation and update H-Q formulation</i>
Management of Water Resources Information System	
	Data collection and management with GIS system
	Update format for easy input to SISDA
	<i>Update format of data input</i>
	<i>Update/create manual on data input</i>
Operation and Maintenance of Water Resources	
	Update, formulation and implementation of O/M rule of water resources facilities and infrastructures
	Low water management (Water distribution, river maintenance flow)
	High water management (flood control operation with stakeholders, especially hydropower sector)
	Sediment Management (Survey of Cross Section at River and Reservoirs)
	<i>Crear/update/improve O/M rules of facilities and infrastructures</i>
	<i>Low Water Management (Water allocation/distribution)</i>
	<i>High Water Management (Coordination with stakeholders for flood control)</i>
Facilitation of activity of coordination team of water resources management	
	Management of TKPSDA team activity as secretariat
	Formulation of “RENCANA PENGELOLAAN SUMBER DAYA AIR WILAYAH SUNGAI” (TONDANO-SANGIHE-TAL
	Plan-Design-Construction-Operation/Maintenance of each projects
	<i>Support for Coordination of Kuwil Dam project</i>
	<i>Support for Coordination of Water Allocation/Distribution of Lolak dam project</i>

Activity 1-5.

Make short- and middle- term CD plans to accomplish the capacity development recognized in “1-4” in the selected RBOs.

For accomplishment of CD recognized in Activity 1-4, it is a best way that project can implement many activities to fulfill of CD for priority issues. However, the project should concentrate only several activities due to current resources of JICA experts and availability of member in BWS Sulawesi I. Therefore, we, JICA

project team and BWS Sulawesi I, agreed that we concentrate three (3) activities,

- 1) Implement flow observation of high water and update H-Q formulation.
- 2) Update/create maintenance manual and conduct training for hydrological instrument.
- 3) Support for making O/M rule of Kuwil Dam.

Figure 2.1.5 shows CD plan until end of the project as a middle-term plan. Figure 2.1.6 shows detail schedule and procedure for CD activity as a short-term plan for implementation of CD activity as On the Job Training (OJT). Short- and middle- term CD plan are created through discussion between BWS Sulawesi I and JICA project team.

Topic	Activity	2017					2018				
Water Resources Management which includes Conservation, Utilization and Damage Control											
Flood Management	Rehabilitation and repair Early Warning System										
	Conduct flow observation and update H-Q formulation of high water for warning System										
	Update/create maintenance manual and conduct maintenance work of hydrological equipment for warning system										
	Flood Hazard Mapping										
Water Quality Management											
Water Quality Management	Sharing water quality situation with stakeholders and water users										
	Utility of Small laboratory, equipment and human development										
	Create manual of patrol and implement patrol										
	Create potential hazard and risk map of water quality										
Coastal Protection											
Coastal Protection	Evaluation of existing structures, including impact to residence and fishery										
	Create technical manual for structural design of coastal protection										
Hydrology System Management											
Hydrology System Management	Rehabilitation and repair equipment to be able to measure flood situation										
	Improve maintenance work of hydrological equipment										
	Flow measurement (low and high water) and update H-Q formulation										
	Human resource development of technician on electric and telecommunication equipment										
	Survey Cross Section at River and Sedimentation in Reservoirs										
	Improve maintenance work of hydrological equipment										
	Improve flow observation and update H-Q formulation										
Management of Water Resources Information System											
Management of Water Resources Information System	Data collection and management with GIS system										
	Update format for easy input to SISDA										
	Update format of data input										
	Update/create manual on data input										
Operation and Maintenance of Water Resources											
Operation and Maintenance of Water Resources	Update, formulation and implementation of O/M rule of water resources facilities and infrastructures										
	Low water management (Water distribution, river maintenance flow)										
	High water management (flood control operation with stakeholders, especially hydropower sector)										
	Sediment Management (Survey of Cross Section at River and Reservoirs)										
	Create/update/improve O/M rules of facilities and infrastructures										
	Low Water Management (Water allocation/distribution)										
	High Water Management (Coordination with stakeholders for flood control)										
Facilitation of activity of coordination team of water resources management											
Facilitation of activity of coordination team of water resources management	Management of TKPSDA team activity as secretariat										
	Formulation of "RENCANA PENGELOLAAN SUMBER DAYA AIR WILAYAH SUNGAI" (TONDANO-SANGHE-TALAUD-MANGAS RIVER BASIN) (Dumoga Sungkub River Basin)										
	Plan-Design-Construction-Operation/Maintenance of each projects										
	Support for Coordination of Kuwil Dam project										
	Support for Coordination of Water Allocation/Distribution of Lolak dam project										
Reference											
Reference	Trainings										

Figure 2.1.5 CD Plan until end of the project as middle-term plan at BWS Sulawesi 1

Activity	2017					2018				
Implement flow observation of high water and update H-Q formulation										
Procedure										
1 Seminar on flow measurement										
2 Conducting flow observation of high water during flood or normal time as a training										
3 Workshop on data analysis and update H-Q formulation										
4 Making a manual for flow observation, data analysis and H-Q formulation										
Update/create maintenance manual and conduct trainings for Hydrological equipment										
Procedure										
1 Seminar on periodical maintenance work for hydrological equipment										
2 Making draft check list and manual on maintenance work for hydrological equipment (small workshops)										
3 Conducting trainings on maintenance work for staff of BWS and operators										
4 Workshop on finalizing/updating check list and maintenance manual										
5 Continue periodical maintenance work by staff of BWS and operators										
Support for making O/M rule of Kuwil Dam										
Procedure										
1 Confirmation on detail plan/design on Kuwil Dam (including field survey)										
2 Seminar on dam operation & maintenance rule (with balai bendungan and consultant?)										
3 Support to make the draft Kuwil dam operation & maintenance rule (small workshops?)										
4 Workshop on finalizing draft rule (for starting stakeholders coordination)										

Figure 2.1.6 Detail schedule and procedure for CD activity at BWS Sulawesi 1

Activity 1-6.

Carry out the capacity development activities* based on the CD plans and the work activities for the priority issues, in the selected RBOs.

JICA Project Team had conducted Capacity Development Activities as OJT with BWS Sulawesi 1. As mentioned above in Activity 1-5, the Project conducted OJTs on three (3) topics as Capacity Development. Table 2.1.24 shows a list of activities for Activity 1-6 at BWS Sulawesi 1. Figure 2.1.7 shows locations of Capacity Development Activity as OJTs.

Table 2.1.24 List of Activities at BWS Sulawesi 1

Date	Activity Type	Contents
Common Activity for three (3) OJT Topics		
June 14, 2017	Seminar	<ul style="list-style-type: none"> - Kick Off Seminar for three (3) OJT Topics - Confirmed Purposes, Schedule and Locations of the OJTs
Nov. 13, 2018	Discussion	<ul style="list-style-type: none"> - Self-Assessment Report of 2017 - Upgrading quality of the Report Contents, especially "Action Plan"
Dec. 11, 2018	Seminar	<ul style="list-style-type: none"> - Wrap Up Seminar for three (3) OJT Topics - Summarized results and outputs of the OJTs
1) Implement flow observation of high water and update H-Q formulation		
March 7-8, 2017	Discussion, Field Activity	<ul style="list-style-type: none"> - Decided four (4) locations for High Water Flow Measurement, 1) Kairagi of Tondano River, 2) Tikala, 3) Sario and 4) Malalayang - Decided "Float Method" as a method of the measurement
April 6, 2017	Discussion, Field Activity	<ul style="list-style-type: none"> - Check the conditions of new relocated position of Kairagi and Malalayang - Setting cross section survey lines as float reference point (existing station), 1st Measurement Line and 2nd Measurement Line
May 3, 2017	Field Activity	<ul style="list-style-type: none"> - Instructing specifications and how to product the "Float" for High Water Flow Measurement at a Workshop
June 6, 2017	Field Activity	<ul style="list-style-type: none"> - Check the available BMs for River Cross Section Survey at four (4) locations
July 25-26, 2017	Discussion Field Activity	<ul style="list-style-type: none"> - Confirmed existing BMs at four (4) locations - Check the availability of necessary equipment for High Water Flow Measurement
Oct. 9-11, 2017	Discussion	<ul style="list-style-type: none"> - Made a draft TOR and Cost Estimation for River Cross Section Survey
Nov. 7-8, 2017	Discussion	<ul style="list-style-type: none"> - Finalized TOR of River Cross Section Survey, especially method and minimum accuracy of survey
Nov. 18-19, 2017	Discussion Field Activity	<ul style="list-style-type: none"> - Shared information on damage by flood, staff gauges at OJT locations washed away. JICA Project will repair it.
Dec. 18-19, 2017	Discussion Field Activity	<ul style="list-style-type: none"> - Site Conditions check for River Cross Section Survey
Jan. 9-11, 2018	Discussion Field Activity	<ul style="list-style-type: none"> - Progress check of River Cross Section Survey
Feb 12-13, 2018	Discussion Field Activity	<ul style="list-style-type: none"> - Check draft drawing of River Cross Section Survey at Office and Sites - Scheduled a site practice of High Water Flow Measurement on March 5-8, 2018
Feb. 26-27, 2018	Discussion Field Activity	<ul style="list-style-type: none"> - Check the output of River Cross Section Survey at Office and Sites - Preparation for Site Practice of High Water Flow Measurement
March. 6-8, 2018	Field Activity	<ul style="list-style-type: none"> - Site Practice on High Water Flow Measurement at Tondano, Tikala and Sario - Workshop on flow velocity and flow rate calculation

End of Mar. 2018	Field Activity	- Finished River Cross Section Survey at Tondano, Tikala and Sario by Survey Company
End of Mar. 2018	Field Activity	- Instruct on producing the Float to Local Workshop in Manado City for continuous supplying the Float to BWS Sulawesi 1
Apr. 25, 2018	Seminar	- Special Seminar on High Water Flow Measurement, support by Japanese short-term experts from MLIT
May 23, 2018	Meeting	- Follow-up discussion for the Special Seminar, handing over a book on Hydrology Management in Japan "Illustration on Hydrology Observation"
Sept. 28, 2018	Field Activity	- Finished installation of Staff Gauges at Tikala, Sario and Malalayang for High Water Flow Measurement
2) Update/create maintenance manual and conduct training for hydrological instrument		
March 7, 2017	Discussion	- Decided a way of OJT, as purchase new AWLR and ARR for OJT
May 3, 2017	Field Activity	- Check candidate location to install new instrument, AWLR and ARR - Decided location to install 1) AWLR at Tikala, 2) ARR at Kuwil Kaleosan
Jun 7, 2017	Discussion	- Deciding type of AWLR and ARR. AWLR is "Non-Contact (Ultra Sonic) Type" at Tikala, ARR is "Tipping Bucket Type" at Kuwil Kaleosan
Jul 25-26, 2017	Field Activity	- Check the site condition in detail for procurement TOR and cost estimation at Tikala for AWLR and at Kuwil Kaleosan for ARR at Kuwil Kaleosan
Oct. 9-11, 2017	Discussion Field Activity	- Changed the type of AWLR, from "Non-contact type" to "Water Pressure Type" - Made a draft TOR of AWLR and ARR procurement
Dec. 18-19, 2017	Discussion	- Making TOR of AWLR and ARR procurement
Jan. 9-11, 2018	Discussion Field Activity	- Condition check for AWLR type - Condition check at Tikala for AWLR Type
Feb. 12-13, 2018	Discussion	- Sharing information on progress of ARR Procurement
Mar. 20-21, 2018	Field Activity	- Finished Installation of ARR at Kuwil Kaleosan, Tipping Bucket Type - Site Practice on Maintenance and Data Download by BWS Sulawesi 1
Apr.-May 2018	Meeting	- Several Discussion on TOR of AWLR at Tikala, Microwave (Non-Contact) Type
Aug. 1, 2018	Field Activity	- Finished Installation of AWLR at Tikala - Site Practice on Maintenance and Data Download by BWS Sulawesi 1
Oct. 16, 2018	Seminar	- Seminar on Specification & Maintenance for ARR and AWLR for Observers - Demonstration and Practice of Periodical Maintenance at Sites
3) Support for making O/M rule of Kuwil Dam		
May 4, 2017	Discussion	- Collecting technical reports and drawings of Kuwil Dam Construction
Nov. 21, 2017	Seminar	- Understanding guidelines and regulation on Dam O/M in Indonesia for making Kuwil & Lolak Dam O/M Plan - Introduction on example of Dam O/M rules and practical O/M works in Japan
Dec. 18-19, 2018	Discussion	- Discussed on purposes and schedule of Field Seminar on March
Jan. 9-11, 2018	Discussion	- Decided schedule, candidate participants for Field Seminar
Feb. 12-13, 2018	Discussion	- Re-scheduling for Field Seminar
Feb. 26-27, 2018	Discussion	- Re-scheduling again for Field Seminar and choosing participants
Apr. 2-6, 2018	Field Activity	- Field Seminar on Real Operation & Maintenance in Indonesia - Visited Jatiluhur Dam (PJT2), Selorejo/Sutami/Sengguruh Dam (PJT1)
Apr. 25, 2018	Seminar	- Special Seminar on Dam Operation & Maintenance, support by Japanese short-term experts from MLIT
Aug. 15, 2018	Seminar	- Seminar on Sediment Management for Dam Reservoir with support by Sub-dit of Dam O/M

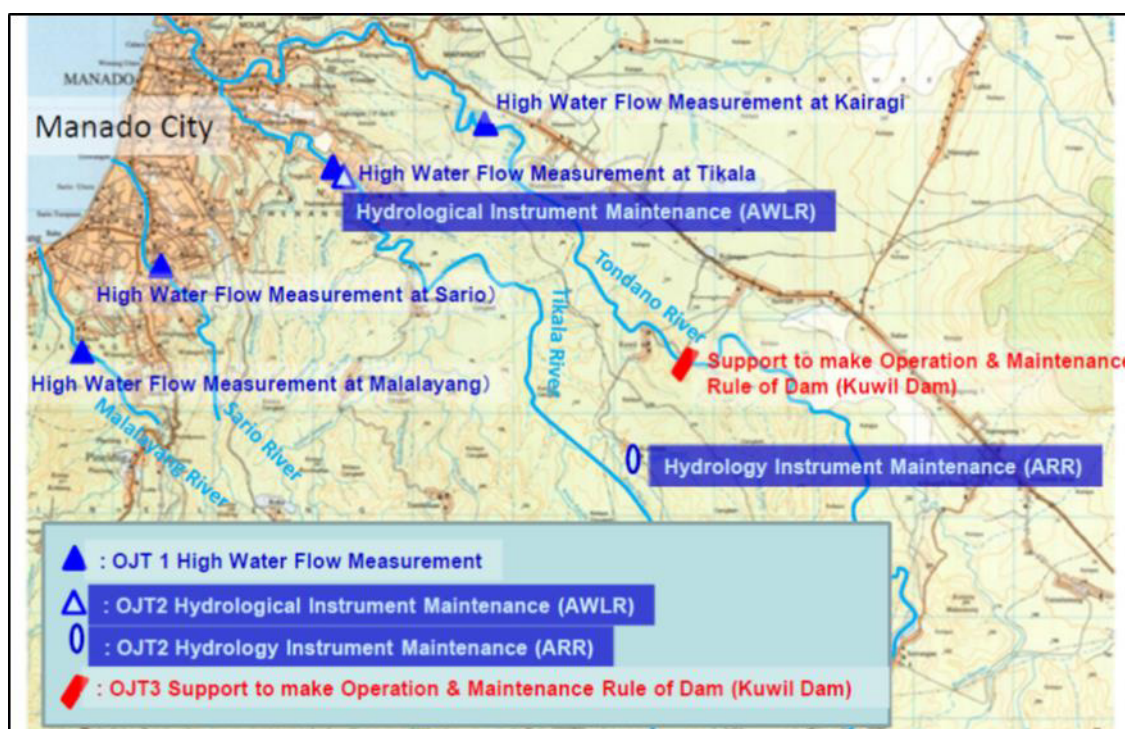


Figure 2.1.7 Locations of Capacity Development Activities as OJTs with BWS Sulawesi 1

The Project had conducted several kinds of activities, such as meetings, Discussion, Seminar and Field Survey or Study. Several activities are described in detail as follows.

- **Common Activities for Three (3) OJT Topics**

- **OJT Kick Off Seminar at BWS Sulawesi 1**

Date: 14th June 2017

Venue: Meeting Room, Novotel Hotel Manado

Participants:

PUPR; Mr. Agus Suprpto, Director of Water Resources Management (Project Director)
Mr. Pradah, Section Chief, Sub-dit of Hydrology & Environment
Mr. Nova, Section Chief, Sub-dit of Dam & Lake O/M
Mr. Andri, Balai Bendungan

BWS; Mr. Audy, chief of O/M, BWS Sulawesi I (RBO project member)
Ms. Ellen, Chief of Program & Planning, BWS Sulawesi I (RBO project member)
Staffs from O/M section including Hydrology unit
Staffs from Dam Construction Project Team
Operators of hydrology stations

JICA Project; Mr. MIURA, Mr. Suzuki, Mr. Sarwono, Mr. Bambang, Mr. Laode, Ms. Titis

Agenda:

Opening Remarks; Mr. Agus Suprpto, Director of Water Resources Management

Project Outline; Mr. MIURA, JICA Technical Expert

- OJT1; High Water Flow Measurement and Update H-Q Curve
 OJT2; Maintenance for Hydrology Instrument
 OJT3; Support for making draft Operation & Maintenance Rule of Kuwil Dam
 Conclusion & Closing Remarks;

Mr. Audy, head of O/M Section, BWS Sulawesi 1

Result:

- ✓ The seminar was conducted successfully. Mr. Agus Suprapto, Project Director kindly attended the seminar from beginning until end.
- ✓ BWS Sulawesi 1 RBO Project Team and other officials understood purposes, schedule and locations of OJTs.
- ✓ OJT1 for High Water Flow Measurement, participants could confirm the Float Method is one of the official methods on flow measurement in Indonesia.
- ✓ Participants emphasized hydrology instrument that JICA Project will install should receive a maintenance service from company in Indonesia.



Photo 2.1.5 Kick Off Seminar for OJTs at BWS Sulawesi 1 on 14 June 2017

Upper Left: Over 40 participants attended, **Upper Right:** Mr. Agus Suprapto, Director of Water Resources Management, PUPR (Project Director) is making an Opening Remarks, **Lower Left:** Mr. MIURA, JICA Technical Expert, is explaining on location and method of High Water Flow Measurement, **Lower-Right:** Group Photo at the end of the Seminar

➤ **Seminar on High Water Flow Measurement and Dam O/M Rule at BWS Sulawesi I**

Date: 25th April 2018

Venue: Meeting Room, Novotel Hotel Manado

Resource Persons:

JICA Short Term Experts; Mr. Maruyama Jun for Dam Operation & Maintenance
(Director of Water Management, River Environment Division, MLIT)
Mr. Ota Hisashi for Hydrology
(Deputy Head of Kofu River and Highway Management Office, MLIT)

Participants:

PUPR; Mr. Nova, Section Chief, Sub-dit of Dam & Lake O/M
Staff from Dam Center, Balai Bendungan
BWS; Mr. Teny, Manager of O/M Project
Staff from O/M section including Hydrology unit
Staff from Dam Construction Project
JICA Project; Mr. MIURA, Mr. Suzuki, Mr. Sarwono, Mr. Bambang, Mr. Laode, Ms. Titis

Agenda:

Opening Remarks; Mr. Nova, Section Head of Sub-dit Dam OP, Directorate of OP
Outline of The Project; Mr. MIURA, JICA Project Expert
Hydrology Observation in Japan; Mr. Ota Hisashi, JICA Short Term Expert
Outputs of the Field Seminar; Mr. Alis, PT. Indrakarya (Consultant of Lolak Dam Project)
Dam OP in Japan; Mr. Maruyama, JICA Short Term Expert
Directions for Dam OP Planning; Mr. Nova, Section Head of Sub-dit Dam OP, Directorate of OP
Closing Remarks; Mr. Teny, Manager of O/M Project, BWS Sulawesi 1

Result:

- ✓ Mr. Ota explained 1) Purposes of Hydrology Observation, 2) Effectiveness of Float Method, 3) Calculation method of H-Q curve. Float method was confirmed as an adequate method for BWS Sulawesi 1 and the presentation material by Mr. Ota on H-Q curve can be used as a useful reference for project activity
- ✓ Mr. Maruyama input four (4) essential points for managing current Dam; 1) Safety and Adequate O/M, 2) Importance of utilizing the effectiveness of dam for long period of time, 3) Maximizing its function of Existing Dams, 4) Flexibility of adapting O/M method with needs in time such as climate change Adaptation
- ✓ Mr. Maruyama introduced the latest technical standards on Dam O/M. It can be used to “Innovation” mentioned by Mr. Agung for Dam OP
- ✓ Mr. Nova presented on organizational Structure, documentation and scheduling for preparation of Dam O/M
- ✓ Participants understood JICA Project would support for drafting O/M Plan and Rules with consideration of inputs from Mr. Maruyama and directions from Mr. Nova



Photo 2.1.6 Seminar on High Water Flow Measurement and Dam O/M Rule with BWS Sulawesi I on 25th April 2018

Upper Left: Presentation by Mr. Ota, **Upper Right:** Presentation by Mr. Maruyama, **Lower Left:** Question on Dam Operation & Maintenance from Participant **Lower Right:** Group photo with Resource Person and Participants

➤ **Wrap Up Seminar on OJT at BWS Sulawesi 1**

Date: 12th December 2018

Venue: Meeting Room, Novotel Hotel Manado

Participants:

BWS; Ms. Jacqueline, head of Sub-Department of Administrative, BWS Sulawesi 1
Mr. Herry, chief of O/M, BWS Sulawesi I (RBO project member)
Mr. Dan, Chief of Implementation, BWS Sulawesi I (RBO project member)
Staffs from O/M section including Hydrology unit
Staffs from Dam Construction Project Team and other BWS RBO Project Team

JICA Project; Mr. MIURA, Mr. Suzuki, Mr. Sarwono, Mr. Bambang, Mr. Laode, Ms. Titis

Agenda:

Opening Remarks; Ms. Jacqueline, Head, Administration Sub-department, BWS Sulawesi 1

Project Outline; Mr. MIURA, JICA Technical Expert

OJT1; High Water Flow Measurement and Update H-Q Curve

Mr. Tommy, Staff of Program & Planning Section, BWS Sulawesi 1

OJT2; Maintenance for Hydrology Instrument

Mr. Brian, Staff of Hydrology Unit, BWS Sulawesi 1

OJT3; Support for making draft Operation & Maintenance Rule of Kuwil Dam

Mr. Arby, Staff of Dam Construction Project Team

Performance Assessment (Benchmarking);

Mr. Bambang, JICA Project

Lesson Learned and Future Expectation for Capacity Development;

Mr. Franky, Staff of Functional Group, BWS Sulawesi 1 (Project Working Team Leader)

Closing Remarks; Mr. Eddy Senior Staff of Functional Group, BWS Sulawesi 1

Result:

- ✓ BWS Sulawesi 1 RBO Project Team and other officials understood outputs of OJTs at BWS Sulawesi 1 and result of Final JCC which was held on 29th Nov. 2018
- ✓ Regarding on OJT1: High Water Flow Measurement, BWS Sulawesi 1 confirmed that outputs are 1) River Cross Section Survey and BM/CP, 2) Manual and Recording Sheets for High Water Flow Measurement at Tikala, Sario and Malalayang
- ✓ Regarding on OJT2: Maintenance works for Hydrology Instrument, BWS Sulawesi 1 confirmed that outputs are 1) AWLR (Microwave non-contact Type) at Tikala, 2) ARR (Tipping Bucket Type) at Kuwil Kaleosan, 3) Periodical Maintenance Check List and Manual
- ✓ Regarding on OJT3: Support for making draft Operation & Maintenance rule of Kuwil Dam, BWS Sulawesi 1 confirmed that output is a Compilation of existing Guideline on Dam O/M and materials of Seminars and Field Study by JICA Project.
- ✓ Mr. MIURA recommended sustainable hydrology observation that includes our activities of OJT 1 and 2. It will contribute certain dam operation and maintenance for future
- ✓ Mr. Eddy made a closing remark, BWS Sulawesi 1 would continue hydrology observation which conducted with JICA Project and refer outputs of JICA Project for BWS's future work



Photo 2.1.7 Wrap Up Seminar on OJT at BWS Sulawesi 1

Upper Left: Ms. Jacqueline and Mr. MIURA are shaking hands just after made sign on document for property transfer, **Upper Right:** Presentation by Mr. MIURA on Project Outline, **Lower Left:** Presentation by Mr. Brian on OJT1, **Lower Right:** Mr. Eddy is making a question on benchmarking and a recommendation for future activity of BWS Sulawesi 1

● OJT1: Implement flow observation of high water and update H-Q formulation

➤ Site Practice of High Water Flow Measurement

Date: 6th to 8th March 2018

Venue: Site Practice at Kairagi, Tondano River, Tikala, Sario

Participants: Six (6) officials from Hydrology Unit, BWS Sulawesi1

Result:

[Site Practice]

- ✓ Site Practice was conducted at three locations, Kairagi at Tondano River, Tikala at Tikala River, Sario at Sario River.
- ✓ Before site practice, float sections were set up. Figure 2.1.8 shows Cross Section with Float Sections at Sario.
- ✓ Before practice, participants checked water depth for selection of adequate float. Table 2.1.25 shows the situation.

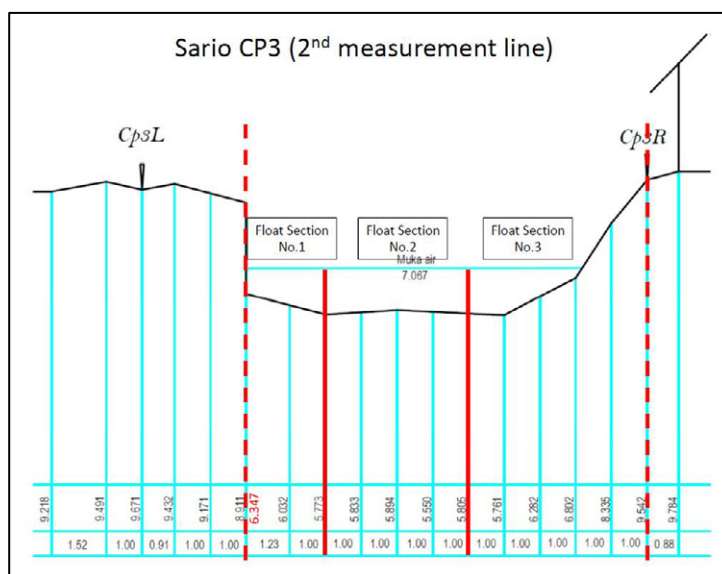


Figure 2.1.8 Float Sections for High Water Flow Measurement at Sario Cp3 (2nd Measurement Line)

Table 2.1.25 Result of site check on Water Level and Depth for High Water Flow Measurement

Location	Float Section 1		Float Section 2		Float Section 3		Water Level*3	Time, date
	Depth*1	Float*2	Depth*1	Float*2	Depth*1	Float*2		
Kairagi	1.0m	0.5m	2.0m	1.0m*	1.0m	0.5m	0.59m	11:15, 06/March/2018
Tikala	0.5m	0.2m	1.0m	0.5m	0.5m	0.2m	1.26m	10:05, 06/March/2018
Sario	0.3m	0.2m	0.5m	0.2m	0.3m	0.2m	0.68m	15:30, 06/March.2018

*1 Depth: Average of water depth at each float section

*2 Float: length of float in the water, it depends on water depth. We have 0.2m (for Surface), 0.5m and 1.0m

*3 Water Level: it is water level at staff gauge as a reference point

[Data Analysis]

- ✓ Participants calculated flow velocity (m/s), Cross Section Area (m²) and Flow Rate (debit, m³/s) of each location, Kairagi, Tikala and Sario. Table 2.1.26 shows result of the calculations.

Table 2.1.26 Results of calculation of Flow Velocity, Cross Section Area and Flow Rate at three (3) locations

Location	Float Section 1			Float Section 2			Float Section 3			Flow Volume (m ³ /s)	Water Level (m)
	Velocity (ms)	Area (m ²)	Flow Rate (m ³ /s)	Velocity (ms)	Area (m ³)	Flow Rate (m ⁴ /s)	Velocity (ms)	Area (m ⁴)	Flow Rate (m ⁵ /s)		
Kairagi	0.92	5.48	5.04	0.77	13.64	10.50	0.77	6.23	4.80	20.34	0.59
Tikala	0.90	3.66	3.29	0.84	8.32	6.99	0.72	4.39	3.16	13.44	1.26
Sario	0.63	1.82	1.15	0.58	3.09	1.79	0.70	2.06	1.44	4.38	0.68

- ✓ We discussed on float, method of measurement for next observation
 - Float of 1.0m was a bit unstable. If possible, length the float should be shorter a little for more stable.
 - At float section No.1 of Sario, we will use 0.5m or 1.0m float, it depends on the water level. If the float is obstacle by stones at river bottom, we will use shorter float such as from 1.0m to 0.5m or 0.5m to 0.2m.

- We will order the float 1) 0.2mm: 200, 2) 0.5m: 100, 3) 1.0m: 100. As mentioned above, float of 1.0m should be shorter for more stable, color of top of all float will be change to orange color.



Photo 2.1.8 Site Practice of High Water Flow Measurement with BWS Sulawesi 1 (1/2)

Upper Left: Briefing by Mr. MIURA just before the measurement at Tikala, **Upper Right:** Conditions at Tikala, positions of float throw and measurement line, Float Sections. **Lower Left:** Float is flowing at Kairagi. **Lower Right:** Participants are throwing the Float at Sario



Photo 2.1.9 Site Practice of High Water Flow Measurement with BWS Sulawesi 1 (2/2)

Left: Reviewing among Mr. MIURA and Participant just after measurement at Kairagi, **Right:** Review Workshop on High Water Flow Measurement and data analysis, calculation of flow velocity and Flow Rate

- **OJT2: Update/create maintenance manual and conduct training for hydrological instrument**
 - **Installation of ARR at Kuwil Kaleosan and AWLR at Tikala**
[ARR at Kuwil Kaleosan]

Date: 20th March 2018

Participants: Mr. Brian, Hydrology unit

Mr. Opo, Hydrology Unit

Mr. Rian, Observer at Kuwil Kaleosan Station

Mr. Taphy, technician, PT. TRISARI TIGAPUTRA UTAMA

Instrument: THIES Precipitation Transmitter (5.4032.35.007)

Data Taker DT82E

Power Supply and Box Panel

Provider: PT. TRISARI TIGAPUTRA UTAMA

- ✓ Installation works was conducted with cooperation among the provider, BWS and Observer at Kuwil Kaleosan
- ✓ Maintenance Training for Officials of BWS was also conducted on 24th March 2018, one day after the installation



Photo 2.1.10 Installation of ARR at Kuwil Kaleosan with BWS Sulawesi 1

Upper Left: Neighbors are seeing Installation works, **Upper Right:** Tipping Bucket Sensor in the ARR, **Lower Left:** Finished Installation, **Lower Right:** Training for Maintenance, especially downloading rainfall data

[AWLR at Tikala]

Date: 27th July 2018

Participants: Mr. Brian, Hydrology unit

Mr. Opo, Hydrology Unit

Mr. Medi, Observer at Tikala Station

- Mr. Taphy, technician, PT. TRISARI TIGAPUTRA UTAMA
- Instrument: Tokyo Keiki KRG-10 Radar Non-Contacting Radar Level Gauge
Data Taker DT82E
Power Supply and Box Panel
Modem GPRS
- Provider: PT. TRISARI TIGAPUTRA UTAMA
- ✓ Installation works was conducted with cooperation among the provider, BWS and Observer at Tikala Water Level Station
 - ✓ Maintenance Training for Officials of BWS was also conducted on 1st August 2018



Photo 2.1.11 Installation of AWLR at Tikala with BWS Sulawesi 1

Upper Left: AWLR with Staff Gauge and Historical High Water Level, **Upper Right:** Sensor part is secured by fence, **Lower Left:** Data Logger (Data Taker DT83E), Battery and Modem GPRS, **Lower Right:** Training for Maintenance, especially downloading Water Level Data

➤ **Seminar and Site Practice on Periodical Maintenance for ARR and AWLR**

- Date: 15th October 2018
- Venue: Classroom Seminar; Meeting Room in Novotel Hotel Manado
Site Practice; Kuwil Kaleosan and Tikala Stations
- Participants: 23 Participants from the Hydrology Unit and other officials from BWS
Observers at Hydrology Stations

Result:

- ✓ Mr. Revly, head of Hydrology Unit, presented on specifications of ARR at Kuwil Kaleosan and AWLR at Tikala. Participants understood advantages of tipping bucket type ARR and Microwave Type AWLR
- ✓ Mr. Brian presented on how to maintain periodically and check list for ARR and AWLR. Participants, especially observers, understood contents of periodical maintenance
- ✓ At site, Mr. Revly and Mr. Brian demonstrated maintenance of ARR at Kuwil Kaleosan and AWLR Tikala. Participants, especially observers understood how to maintain, and the maintenance is not difficult for them



Photo 2.1.12 Seminar and Site Practice on Periodical Maintenance for ARR and AWLR at BWS Sulawesi 1

Upper Left: Mr. Revly is explaining on specifications of ARR and AWLR, **Upper Right:** Mr. Medi, Observer at Tikala Stations, is making a question about specification and maintenance of ALWR, **Lower Left:** Mr. Brian is demonstrating maintenance work for ARR at Kuwil Kaleosan, **Lower Right:** Mr. Revly is explaining on system of Data Logger and Data Transmission

● **OJT3: Support for making O/M rule of Kuwil Dam**
➤ **Field Seminar on Dam Operation & Maintenance**

Date: 2nd April 2018 to 6th April 2018

Participants: Nine (9) Participants

No.	Name	Position	Institution
1.	Sardjon Welliang	Functional Group	BWS Sulawesi I
2.	Immanuel Franky Makasache	Functional group	BWS Sulawesi I
3.	Herry Talumepa	Head of OP Section	BWS Sulawesi I

4.	Frinny Lele	Head of Sub-Section, OP Section	BWS Sulawesi I
5.	Davidson Lombogia	Engineer, Lolak Dam Project	BWS Sulawesi I
6.	Fenancius Umboh	Staff, Lolak Dam Project	BWS Sulawesi I
7.	Bahari Rifai	Staff, Lolak Dam Project	BWS Sulawesi I
8.	Bernadet Leung	Supervisor, Kuwil Dam Project	BWS Sulawesi I
9.	Aris Andrian	Consultant, Lolak Dam Project	Indra Karya

Schedule: 2nd April: Sub-dit of Dam O/M, PUPR in Jakarta
 3rd April: PJT2 and Jatiluhur Dam in West Java
 4th April: Move from Bandung to Malang
 5th April: Selorejo Dam, PJT1 in East Java
 6th April: Sengguruh, Sutami and Lahor Dam, PJT1 in East Java
 Wrap Up Meeting



Photo 2.1.13 Field Seminar on Dam Operation & Maintenance with BWS Sulawesi 1

Upper Left: Participants are receiving guidance on Dam O/M Planning and Monitoring System at Dam Monitoring Center at PUPR HQs, **Upper Right:** Participants are observing a lot of house and fish net on the Reservoir of Jatiluhur Dam **Lower Left:** Mr. Herry and Participants is checking piezometer at Selorejo Dam, **Lower Right:** At the end of the field seminar, we had a wrap up meeting

Activity 1-7.

Evaluate regularly the capacity of the RBOs through the progress on implementation of CD plans including the trainings, and the daily work activities to the priority issues, by various methods such as interviews to the staff, existing RBO benchmarking indicators and job assessment.

Regular evaluation of capacity of RBOs has been conducted by all BBWS and BWS, including BWS Sulawesi 1, as a “Performance Assessment” in the Benchmarking. BWS Sulawesi 1 has conducted “Self-Assessment of Performance” at several years. JICA Project used their result of Self-Assessment for Activity 1-7. And

JICA Project supported for upgrading the report of Self-Assessment of Performance.

Table 2.1.27 shows Benchmarking Scores of BWS Sulawesi 1.

Table 2.1.27 Benchmarking Scores of BWS Sulawesi 1

Year	2015	2016	2017	2018
Benchmarking Score	2.67	2.77	2.97	3.13

JICA Project support for upgrading the Self-Assessment Report in 2017 of BWS Sulawesi 1. Summary of result of Assessment is follows.

Table 2.1.28 Summary of Benchmarking Score of BWS Sulawesi 1 on 2017

No.	Indicators	Score 2017	
		SA	Review
	Mission		
1	Status of SDA Management Institution	3.5	3.5
2	Governance of Water Resources	3.0	3.0
	Stakeholders		
3	Involvement of Water Users	3.0	3.0
4	Feedback from Water Users	3.0	3.0
5	Environmental Audit	2.5	3.0
6	Decent Living Standards in Related River Basins	2.5	3.0
	Learning and Growth		
7	Human Resources Development	3.5	3.5
8	Technical Development	3.0	3.0
9	Development of Water Resources Managing Institution	3.0	3.0
	Internal Organizational Governance		
10	Governance Planning in SDA Management Institution	3.5	3.5
11	Utilization of WR, Water Allocation, Drought & Licensing	3.0	3.0
12	Control of Water Damage	2.5	2.5
13	Data (SISDA) Processing	3.0	3.0
	Finance		
14	Cost Recovery	2.5	2.5
15	Financial Efficiency	1.5	2.0
	Total Score	43.0	44.5
	Average Score for Each Indicator	2.9	3.0

Activity 1-8.

Consolidate good or bad practices, lessons and challenges learnt through the field practices, based on the output of “1-7”.

The Report on Performance Assessment of Benchmarking usually describes “Action Plan”. It mentions about necessary efforts and program that will be conducted for the improvement of the performance toward to target score. The efforts and program include several challenges that are reflected from working experiences as good or bad practices. Therefore, it can be said that efforts and program in “Action Plan” are consolidated practices, lessons and challenges for capacity development.

The challenges that are related with JICA Project's OJT Topics is mentioned with descriptions of the Benchmarking Report as followings.

➤ **Implement flow observation of high water and update H-Q formulation**

Indicator No.12: Control of Water Damage

- 1) Implement the flood management system
- 2) Increased human resources in the field of flooding and control of water damage

Indicator No.13: Data Management (Management of SISDA)

- 1) Develop a data bank
- 2) Implement an integrated data system
- 3) Availability of natural resource information systems that are easily accessible and free in the management of natural resources

➤ **Update/create maintenance manual and conduct training for hydrological instrument**

Indicator No.12: Control of Water Damage

- 3) Availability of Real Telemetry for SDA data

Indicator No.13: Data Management (Management of SISDA)

- 1) Develop a data bank
- 2) Implement an integrated data system
- 3) Availability of natural resource information systems that are easily accessible and free in the management of natural resources
- 4) Increased human resources in the field of information systems
- 5) Develop a real-time Telemetry system

Activity 1-9.

Improve each CD plans, considering the output of 1-8, and carry out the revised plans in the selected RBOs.

At BWS Sulawesi 1, JICA Project had considered latest issues on Water Resources Management in Tondano and other River Basins. BWS Sulawesi 1 is planning hydrology observation networks, increasing type of instrument. Because the one of the important issues on Water Resources Management in BWS Sulawesi 1 is to develop real-time observation system. This issue is mentioned on Activity 1-8 from "Action Plan" for Indicator No.13 (Data Management) on Self-Assessment Report of Benchmarking 2017.

Therefore, JICA Project with BWS Sulawesi 1 revised specification of Automatic Water Level Sensor (AWLR) at Tikala to add a modem for real-time data transmission. Moreover, JICA Project conducted a Seminar and Site Practice on Hydrology Instrument Maintenance on October 2017. Officials from BWS Sulawesi 1 and Observers at Hydrology Stations participated to develop knowledge and understanding on data transmission system effectiveness, moreover, learned how to maintain periodically the AWLR. It is also contributed for 4) Increased human resources in the field of information systems, Indicator No.13: Data Management (Management of SISDA), related with OJT: Update/create maintenance manual and conduct

training for hydrological instrument.

(2) Activity 2

Activity 2-1.

Review the existing CDF and activities by the key players (DGWR, PUSAIR, CRBOM, PUSDIKLAT).

1) Organizations

After starting the Project, Human Resources Development Agency (hereinafter referred to as “HRDA”, also known in Indonesian language, “BPSDM”) has been established in June 2015. Ministerial Regulation No.15 in 2015 (15/PRT/M/2015) defines functions of BPSDM as follows;

1. Preparation of technical policies, plans, and programs of Human Resources Development for PUPR
2. Implementation of human resource development activities for PUPR
3. Implementation of competency assessment of human resources within PUPR
4. Guidance, development and empowerment of functional positions on Human Resources Development in PUPR
5. Monitoring, evaluating and reporting on the implementation of human resource development in PUPR
6. Implementation of the administration of the Human Resources Development Agency
7. Implementation of other functions provided by the Minister

According to these functions, all “Training”, which is also clearly defined with all conditions such as duration and the number of subjects / class should be provides within the training, etc, in PUPR must be implemented by HRDA. Therefore, all Directorate Generals and Agencies in PUPR, donors should follow the instruction / recommendation and coordinate with HRDA for the implementation of Training for the staff of PUPR. It is meaningful for comprehensive and effective management of human resources development by HRDA.

On the other hands, other institution, such as Center for River Basin Organization and Management (hereinafter referred to as “CRBOM”) and Dissemination Unit for Water Resources Management Technology (hereinafter referred to as “DUWRMT”) that were Counterpart Institution for JICA Project Phase 1, transferred a part of their functions for training implementations to HRDA.

Figure 2.1.9 shows organization chart on Capacity Development in the field of Water Resources in PUPR.

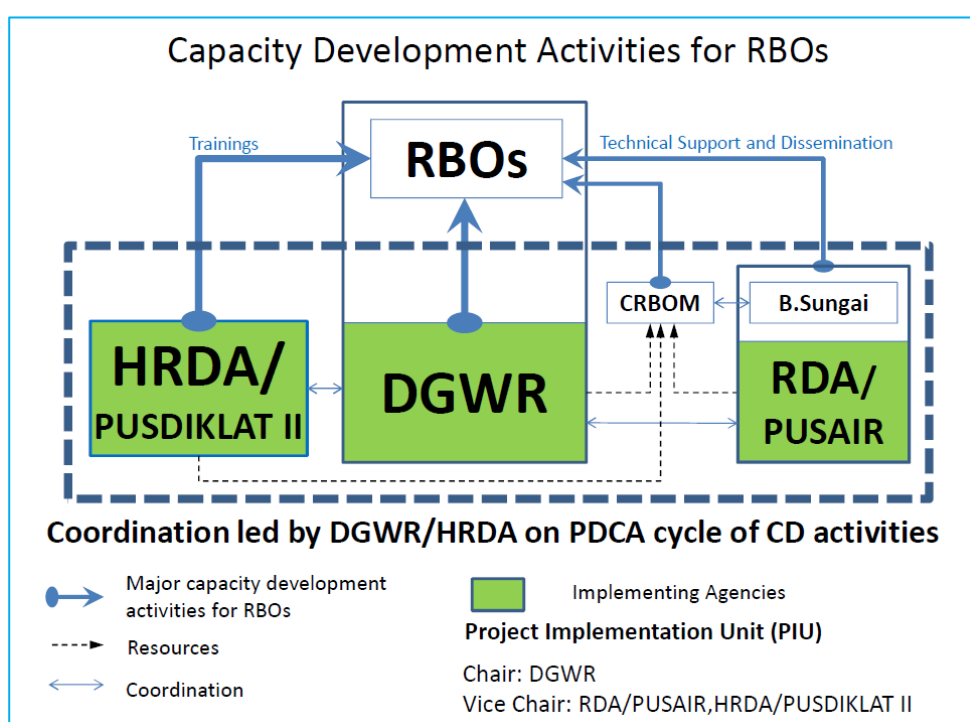


Figure 2.1.9 Project Organization Chart for Capacity Development Activities for RBOs

2) Implementation of Training

By the structural changes within the Ministry, HRDA is responsible for conducting all training for the staff of PUPR. Therefore, PIU recommended JICA Project Team to cooperate with HRDA for training on Water Resources Management for all RBOs for Activity 2-2.

During implementation of the Training, administrative works and procedure as well as responsibility of related offices for training implementation have been clearly identified. Each step of training implementation is described below.

➤ Preparation for Annual Training Plan

PIU and JICA Project Team discuss and select appropriate training topics for all RBOs and draft an annual training plan. JICA Project and HRDA, then, decide the number of training conduct and topic of the training depends on the needs of the ministry. Both sides especially consider, 1) matching with the direction of the government such as the contents of Mid-Term Strategic Plan of PUPR, responsibility of B(B)WSs and important issues on Water Resources Management, 2) Availability of suitable lecturers, 3) proper training area with an adequate site for field study, 4) timing of the training - avoiding busy season for encouraging high rate of the participation of trainees.

For the annual plan of 2016, PIU and JICA Project Team worked together with the Division of Planning & Evaluation of HDRA in Headquarters of PUPR, which approves and allocates annual budget for training as well as helps to coordinate with local training centers for preparation and implementation of the training. We also coordinated with Training Center on Construction and Water Resources (hereinafter referred to as “PUSDIKLAT”) of HRDA in Bandung for annual training plan, curriculum

and syllabus since 2017. Gradually Head office of HRDA understood and cooperated more on the Project activity and supported for preparation and procedure for training implementation.

Table 2.1.29 shows the finalized annual training plan in 2016 by JICA Project, first submission was on 14th Sept. 2016, Finalized on 30th Nov. 2016.

➤ **Preparation of Curriculum and Syllabus**

After finalizing the annual training plan, JICA Project Team prepared a curriculum and syllabus of each training. Creating the curriculum requires the availability of necessary resources including finding appropriate lecturer. It is also important to mention that a “Training” needs to have more than thirty unit of lesson, which usually expressed as JP in Indonesian language. A JP is 45 minutes of lesson. Without putting enough JP, a training would not be considered as a proper training of the ministry. If not considered as a training, the participant would not be able to receive a training certificate once it completes.

Figure 2.1.10 shows one of the Curriculum & Syllabus of Training on Dam Operation & Maintenance by JICA Project in Malang City, East Java Province, on February 2016.

Table 2.1.29 Annual training plan of 2016 by JICA Project

2016 Annual Training Plan by JICA Project							Background
No.	Title	Type	Duration	Participants	Venue	Budget Allocation	
1	Dam Operation and Maintenance	Classroom and Field Study	3 days, Beginning of Feb.	Number : Approx. 30 Target : Practitioner level Organization : B(B)WS with dam	Malang (Surabaya)		Gov. of Indonesia has implemented 65 dam construction projects in 5 years, which need to be managed properly
2	Water Allocation	Classroom and Field Study	3 days, End of Feb. (Flexible but not in March)	Number : Approx. 30 Target : Practitioner level Organization : B(B)WS with many water users	Makassar		Regarding Water Allocation, Water Service Fee System will be started. B(B)WS will have to implement water service fee collection from water users.
3	Flood Management	Classroom and Field Study	3 days Tentatively Middle of May	Number : Approx. 30 Target : Practitioner level Organization : B(B)WS suffered from flood recent year	Manado		Many river basins have been suffered from flood recently. Regarding project's FP sites, 1) Ciliwung/Cisadane River Basin has suffered from flood, especially by internal inundation. 2) Sulawesi I (Manado) suffered from flood in Feb. 2013 and Jan. 2014, especially by flash flood
4	Maintenance for Water Resources Infrastructure	Classroom and Field Study	3 days Tentatively End of Aug.	Number : Approx. 30 Target : Practitioner level Organization : B(B)WS with water resources infrastructures, such as dam, weir and canal system, etc.	Bandung	PUPR : -Travel fee / Accommodation Allowance for Participant -Cost for Indonesian Lecturers -Printing Fee of Textbook for the Lecturers by Indonesian Lecturers	Existing Facilities for Water Resources Management, such as dam, weir and their gates and so on, will be deteriorated as time goes by. B(B)WS should conduct proper daily and periodically maintenance, and asset management.
5	Operation and Maintenance for Irrigation	Classroom and Field Study	4 days Tentatively End of Oct.	Number : Approx. 30 Target : Practitioner level Organization : B(B)WS that have irrigation area / Farmers Association	Makassar	JICA : -Cost for Japanese Lecturers -Venue Fee -Interpreter Fee -Printing Fee of Textbook for the Lecturers by Japanese Lecturers -Stationary Fee	Gov. of Indonesia has implemented a project to develop 1.0 million ha agriculture field in 5 years for food security policy. B(B)WS need to manage water distribution, irrigation facility and coordination of stakeholders properly.
6	River Facility Maintenance	Classroom	3 days, Tentatively Late Feb.	Number : Approx. 30 Target : Technician level Organization : SDR, B(B)WS, Local Government, related Organization	Jakarta		In Japan, as the number of facilities more than 30 years old increases in the coming years, it is considered that the costs of maintaining, managing and renewing the facilities will increase. Therefore it is important to appropriately and efficiently manage, maintain, and improve the facilities so that facilities can be utilized as good quality stock. We plan to consider practical maintenance plan in referring to current challenges and a plan conducted in Japan.
7	River Management (Water Quality, Low Water)	Classroom and Site Visit	3 days, Tentatively in May	Number : Approx. 30 Target : Technician level Organization : SDR, B(B)WS, Local Government, related Organization	Jakarta		A number of rivers flowing in a city have problems such as water quality, low water management and etc. Low water management is also related with water quality, eco-system and etc. So we consider worth of low water and how to decide volume of low water.
8	River Rehabilitation	Classroom and Site Visit	3 days, Tentatively in Late Jul.	Number : Approx. 30 Target : Technician level Organization : SDR, B(B)WS, Local Government, related Organization	Jakarta		Even though Rivers have a highly potential as symbol and Oasis for civilians and visitors, there are big challenges for many rivers to realize so. It seems important for PU to coordinate between related organizations. This training is to support to consider about what we, administrator, be able to do and what we should do to improve the worth of Rivers for the future.

Training on Dam Operation & Maintenance				
1. Time and Duration From 2nd Feb. 2016 (Tue.) to 5th of Feb. 2016 (Fri.), for 4 days				
2. Venue In Malang city area - Classroom Lectures: In Malang City (Atria Hotel, Jl. Letjen S. Parman No. 87 - 89 - Malang) - Field Study: Sutami Dam and Sengguruh Dam				
3. Expected Participants Staff from All B(B)WS, - Education Background and Level: Science and Engineering, Bachelor Degree or higher - Year of Experience: Over 3 years on Water Resources Management - Current Responsibility: Operation / Maintenance of Dam and other Water Resources Infrastructures				
4. Curriculum				
Day	No.	Time	Lecture	Lecturer
1st (Tue.)	08:00-		Registration	Prof. Dr. Y. Arita Fomart (Eco-Sociologist), MT, Head of Human Resources Development PUSDI
	08:45 - 09:15		Opening Remarks	Mura Hirohisa, JICA Project Expert
	09:15 - 09:45		Explanation on JICA Project	Secretariat Member
	09:45 - 10:00		General Information for Participants	Secretariat Member
	10:00 - 10:30		Pre Test	Secretariat Member
	10:45 - 12:15		Outline of Dam O/M in Japan	Mura Hirohisa, JICA Project Expert
			Lunch	
	13:15 - 14:45		Current Status of Dam O/M in Indonesia	
			Coffee Break	
	15:00 - 16:30		Maintenance Work of Telecommunication/Electrical and Mechanical Facility in Japan	Mr. Sugura Masahiro, JICA Short Term Expert, Deputy Director of International Affairs Division, Water Resources Engineering Department, Japan Water Agency
2nd (Wed.)	16:30 - 17:15		Briefing on Field Study	CGWR, PUPRS Representative of PJT1 JICA Project Expert
	08:00 - 10:00		Travel to Sutami Dam	
	10:00 - 10:30		General Explanation on Sutami and Lahor Dam Operation Room on Spillway (Maintenance Work) at Sutami Dam	PJT1
	10:30 - 12:30		Check of Dam Body (Dam Body Safety Observation) at Sutami Dam	PJT1
			Telecommunication Equipment at Lahor Dam	PJT1
	12:30 - 13:30		Lunch	
	13:30 - 14:00		Travel to Sengguruh Dam	
	14:00 - 16:00		Spot Ship of Sedimentation Backlog of Sedimentation	PJT1
	16:00 - 18:00		Return to Malang	
	08:00 - 09:45		Feedback of Field Study on 2nd Day	CGWR, PUPRS PJT1 JICA Project Expert
3rd (Thu.)			Coffee Break	
	10:00 - 11:30		Dam Safety and Dam Body Observation	Mr. Akihiro Katsura, Head of State Bureaus, CGWR, PUPRS
			Lunch	
	13:00 - 15:15		Integrated Flood Control of Dams in Japan	Mura, JICA Project Expert
			Coffee Break	
	15:30 - 17:00		Water Balance of Dam Reservoir and Operation	Dr. Fuhara Shunroku, MT, Hydrological Engineering Researcher, PUSDI
	11:00 - 09:30		Water Quality Management of Dam Reservoir in Japan	Mura, JICA Project Expert
			Coffee Break	
	09:45 - 11:15		Sediment Management in Indonesia	Mr. Naomichi, CGWR, Head of Sub-Office of Operation and Maintenance of River and Coastal
			Lunch	
4th (Fri.)	13:15 - 13:45		Post Test	Secretariat Member
	13:45 - 14:15		Discussion and Question	JICA Project Expert, CGWR, PUPRS and Others
	14:15 - 14:30		Evaluation of the training (Filling in Evaluation Sheet)	Secretariat Member
	14:30 - 14:45		Closing Remarks	Mr. Lully Martinus, MT, Director Directorate of Operation and Maintenance

Syllabus	
Lecture No.	1
Title	Outline of Dam Operation and Maintenance (O/M) in Japan
Outline	Dam O/M includes various aspects, flood control, water supply, observation of hydro meteorological data, facility maintenance, etc. Required work as a good engineer / technician for Dam O/M will be described and used as an example in the lecture.
Objective	-Introduction of framework and actual operation for dam O/M in Japan -Comparing between Japanese and Indonesian case* to find differences in dam operation / maintenance which should be tackled for the improvement *Indonesia case is described in lecture No.2 "Current Status of Dam O/M in Indonesia"
Lecturer	MIURA Hirohisa, JICA long term expert for the project on Capacity Development for RBOs in Integrated Water Resources Management in Indonesia (Phase 2)
Duration	90 minutes (2 JP)
Contents	-Law, Standards, Guideline for Dam O/M -Organizational and Financial System for Dam O/M -Water Balance of Dam Reservoir Capacity (Distribution) for High and Low Water -Observation and Inspection for Dam Safety
Textbook, Module	Power Point File "Outline of Dam operation and maintenance in Japan" PowerPoint file, made by lecturer
References	

Figure 2.1.10 Example of the Curriculum & Syllabus

(Left: Curriculum of Training on Dam Operation & Maintenance on Feb. 2016)

(Right: Syllabus of one of the Lecture in Dam O/M Training)

➤ Selection and recruitment of resources person (lecturers)

After finalizing curriculum and syllabus, PIU, PUSDIKLAT and JICA Project team selected adequate resource persons for lectures in the training. The lecturers would be selected as follows;

- Lecture on Legal System: Current Director of Directorate or Head of Sub-dit
- Calculation exercise lecture: Senior Engineer and Expert
- Lecture on research, design, analysis: Researcher from research institute
- Project Example and Management: Engineers from B(B)WS or PJT1 or PJT2

Once candidate lecturers were selected, PUSDIKLAT send a request letter.

At 2nd PIU meeting on 19th December 2016, detail procedure of lecturer selection was discussed and approved. Figure 2.1.12 shows the procedure of recruitment of lecturer for training.

➤ Selection and Invitation of Training Participants

JICA Project Training sets the requirement for participants to maximize the impact of the training. The participant should have 1) Educational Background: bachelor's degree or higher in Science and Engineering, 2) Years of Experience: Over 3 years on Water Resources Management, 3) Current Job

Responsibility: matching with training topics. Procedure of participant selection and invitation was also confirmed at 2nd PIU meeting. Figure 2.1.11 shows the procedure and responsible party of each step for training participant selection and invitation.

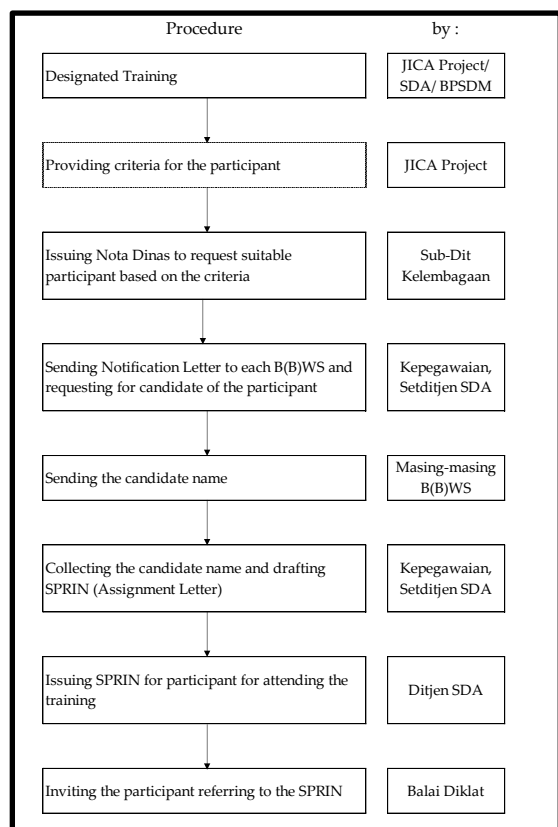


Figure 2.1.11 Procedure and Responsible Division of each step for training participants selection and invitation

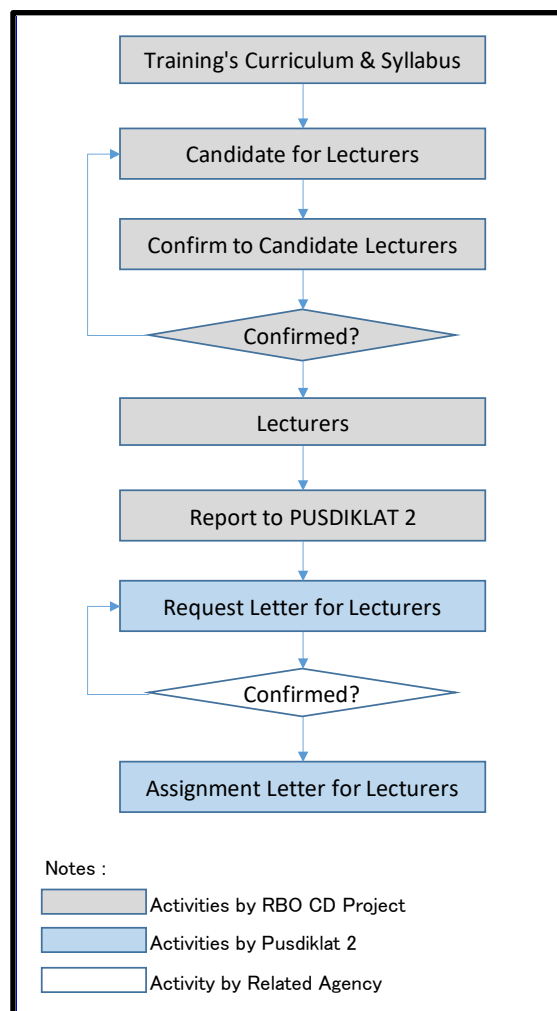


Figure 2.1.12 Procedure of Recruitment of Lecturer for Training

➤ Administrative Arrangement

HRDA has nine (9) training institutes (Balai DIKLAT). Each located in Medan, Palembang, Jakarta, Bandung, Yogyakarta, Surabaya, Banjarmasin, Makassar and Jayapura. PUSDIKLAT, PIU and JICA Project Team coordinated with selected Balai DIKLAT for training implementation. The training usually conducted in Balai DIKLAT facilities. However, those training centers sometimes fully occupied. In such occasion, the training was conducted in other than training center, such as hotel.

➤ Preparation for Field Study

Each training usually includes field study where the trainee goes to the site for practical study outside of class room. Therefore, when the annual training plan was discussed, the candidate sites for field study was also put into the consideration PIU, Balai DIKLAT and JICA Project Team visited the site

for getting proper support before conducting training. Balai DIKLAT even sent a request letter to owner of field study site.

➤ **Implementation of the Training**

Training were managed by Balai DIKLAT which also assigned personnel for registration works, preparation for training equipment, Master of Ceremony, orientation for participants, control and management of training schedule, preparation for field study, evaluation of the participants / lecture material / lecturer / facility, and certificating training completion for participants.

➤ **Evaluation of the Participants**

HRDA has a standard of evaluation of participants, lecture material, lecturers, and the facility. Table 2.1.30 shows items of evaluation and evaluators.

Table 2.1.30 Evaluation Items for Training

Evaluation on;	Items	Evaluated by	Remarks
Participants	- Attitude (during lecture and quality of questions)	Lecturers	by evaluation sheet
Lecture material	- Relation with works - Effectiveness - Quality - Difficulty - Using media tools - Volume for time allocation	Participants	by Questionnaire sheet that is prepared by Balai DIKLAT
Lecturer	- Mastery - Time allocation - Systematic - Method and using tools - Sympathy, style and attitude - Speaking quality - Providing motivation - Achievement of purpose - Question time - Quality of answer	Participants	by Questionnaire sheet that is prepared by Balai DIKLAT
Management	- Education procedure & elements - Conditions of classroom - Conditions of dormitory room - Meals and conditions of dining room - Health, transportation and recreation service - Facility condition	Participants	by Questionnaire sheet that is prepared by Balai DIKLAT



Photo 2.1.14 Meeting, Discussion and Activity for Planning and Preparation for Training

Upper Left: Meeting on Annual Training Plan 2016 with Ms. Anita, Head of HRDA, Dr. Arie, Head of RDA on Aug. 2015

Upper Right: Discussion for Field Study Preparation between Balai DIKLAT Bandung and BBWS Citarum with JICA Project for Training on Maintenance of Water Resources Infrastructures that was held on Aug. 2016

Lower Left: Meeting with Balai DIKLAT Bandung on Training Implementation, Jun. 2016

Lower Right: Field Study Site Checking at Wonogiri Dam with Balai DIKLAT Yogyakarta, BBWS Bengawan Solo with JICA Project, Feb. 2017

3) Training by HRDA

- A number of training course by HRDA are designed and aimed for young engineers, such as operators, observers and other labors, not intended for middle carrier engineer who has sufficient work experience in the field. Therefore, those topics include somewhat mismatch with their needs.
- On the other hand, JICA Project Training was aimed for middle to senior engineer with enough working experience, such as 5 or more years of experience, with at least a bachelor or higher degree holder for the educational back ground.
- In addition to the different target for the participants between HRDA conducted training and JICA's, the project team also ensured that there was no overlapping.

4) Summary

- Implementation of training by HRDA is well managed conducting a number of training in various fields
- Implementation procedure for training has been clearly identified as mentioned above in (2)
- Main target of training by HRDA is young engineers. Therefore, JICA Project conducted training for middle to senior engineer with enough working experience

Activity 2-2.

Carry out CD activities* along with short- and mid-term plans of for RBOs across the country under CDF.

JICA Project conducted training under Capacity Development Activity (hereinafter referred to as “CDA”) mentioned in Activity 2-1 of Project Design Matrix (hereinafter referred to as “PDM”). JICA followed HRDA’s annual training plan which is usually compiled in August of the previous year to ensure that JICA conducted training would be in line with PU direction of human resource development.

1) Training in 2016

JICA Project submitted the Annual Training Plan 2016 on August 2015. The plan was finalized at the end of November 2015 in which included eight (8) JICA training for all BBWS and BWS. Table 2.1.31 shows the result of the training in 2016.

Table 2.1.31 Result of Training in 2016

No.	Title	Venue	Duration	Objectives	Participants	Lectures and Lecturers	Field Study	Result of Test	Questionnaire
1	Dam Operation and Maintenance	Malang (Balai DIKLAT Surabaya)	4 days, Feb 2nd to 5th	Government of Indonesia has started to build 65 dams in 5 years - Knowing effective ways to operate and maintain these dams	Number: 26 Organization: BJBWS, Balai Berhidang, Direktorat Bina OP, Direktorat Bina PSDA, Pusat Dams PU Provinsi dan Kab.	From Indonesia side - Status of Dam O/M, by Ir. Joko Mulyono, ME - Dam Safety and Dam Body Observation, by Ir. Achmad Zubaidi, ME - Water Balance of Dam Reservoir, Drs. Herus Syamman, MT - Dam Management, by Ir. Inan Manglano, Dip, HE From Japan side - Outline of Dam O/M - Maintenance Work of Telecommunication/Mechanical Facility - Integrated Flood Control of Dams	Topic - Dam Safety - Operation / Maintenance - Sediment Management - Slides - Sutami Dam - Lahor Dam - Seniguruh Dam	Average score of questions on Legal Aspect - Legal Framework - Database and Inventory were lower than score of other topics	"Sediment Management" in the field of Dam O/M was raised as an important issue.
2	Water Allocation	Makassar (Balai DIKLAT Makassar)	4 days, Feb 23rd to 26th	BJBWS will have to implement water service fee collection from water user - Knowing more about: - Legal Aspect - Data preparation for calculation on water demand, - Coordination with water users.	Number: 26 Organization: BJBWS, Balai Berhidang, Direktorat Bina OP, Direktorat Bina PSDA, Dinas PU Provinsi dan Kab.	From Indonesia side - Water balance, by Drs. Elia Nugraha A., ST, MPM, PDS - Water balance calculation, by Drs. Elia Nugraha A., ST, MPM, PDS - SDA Water Use Permit System, by Ir. Sami Saegijanto, ME - Water Service Fee System, by Ir. Triyono Tulus Setyawan, M. Eng From Japan side - Bill-Bill Dam - Water User Coordination and Water Distribution for Irrigation - Water User Right and Water User Charge for O/M	Topic - Stakeholders Coordination - Intake and distribution for Irrigation - Site - Bill-Bill Dam - PDAM Makassar	Average score of questions on SDA - SDA Water Service Fee - Water User Coordination were lower than score of other topics	"Water balance" and "Water Allocation" in the field of Water Allocation was raised as an important issue.
3	Flood Management	Manado (Balai DIKLAT Makassar)	4 days, May 10th to 13th	Understand more about: - Flood Management and Master Planning - Warning system for flood - Flood management and disaster management, especially flood management	Number: 33 Organization: BJBWS, Dinas PU Provinsi dan Kab, Dinas PSDA Prov. dan Kab.	From Indonesia side - Current Status and Basic Knowledge of Flood, by Ir. Brendalano, MT - Flood Warning System, by Dr. Elia Nugraha A., ST, MPM, PDS From Japan side - Comprehensive Structural Measures for Flood - Regional Disaster Management Planning - Example of Master Flood Management Plan in Tondano River Basin - Example of Structural Measures for Flood in Tondano River Basin	Topic - Emergency response - Demonstration of AR technology river water level observation - Site - BPDS Sulawesi Utara - Inundated areas at Tondano, Tilaka and Sero Rivers	Average score of questions on Emergency Response - Emergency Response were lower than score of other topics	"Designing/building Structural Measures for Flood" in the field of Flood Management was raised as an important issue.
4	River Facility Maintenance	Jakarta (Balai DIKLAT III Jakarta)	4 days, Aug. 9th-12th, 2016	Knowing better about: - Maintenance Work for River Facility - Database and Inventory - Practical maintenance works for river facility	Number: 33 Organization: BJBWS, Direktorat Pengembangan Jaringan SDA, Dinas SDA Prov.	From Indonesia side - Legal Aspect and Current Status, by Mr. Hendra Ahyadi, ST, MT - Database of River Facility, by Dr. Ismail Widadi, ST, M.Sc. - River Facility Inventory for Maintenance, by Mr. Hendra Ahyadi, ST, MT From Japan side - Practical Maintenance Works focusing on Weir, by BJBWS CI Cs - Maintenance Works of River and Facility - River Facility Inventory for maintenance work	Topic - Maintenance/inspection of structures (weir, (flow way) and equipment/instrument - Site - Kaulajampa Weir - East Banjir Canal - Mangaral Gate	Average score of questions on Legal Framework - Database and Inventory were lower than score of other topics	"Database & Inventory Facility" in the field of Flood Management was raised as an important issue.
5	Maintenance for Infrastructure (WRI)	Banding (Balai DIKLAT Bandung)	4 days Aug 30th to Sep 2nd.	Understand more about: - Maintenance Works for WRI - Database and Inventory for Maintenance - Asset Management of WRI - Practical Maintenance works	Number: 30 Organization: BJBWS, Inspektori Jenderal PUP, Direktorat P3 SDA, Balai Diklat IV Bandung.	From Indonesia side - Legal Aspect and Current Status, by Ir. Muhammad Asdin Thalib, MT - Database of WRI, by Dr. Ismail Widadi, ST, M.Sc. - Inventory of WRI for Maintenance, by Ir. Setono Suardi, Dipl. HE - Practical Maintenance Works for small-scale dam, by BJBWS CI Cs - Practical Maintenance Works for Hydrology Network, by DSBK From Japan side - Asset Management of Water Resources Infrastructure - Maintenance Works of Dam	Topic - Observation of 1) Deformation of dam body, 2) Seepage, for dam safety - Practical maintenance work for Hydrological Instrument - Site - Ciluncia & Cipanjung Dam, - Lab. Hydrology Ciluncia	Average score of questions on Legal Framework - Database and Inventory were lower than score of other topics	"Database & Inventory Facility" in the field of Flood Management was raised as an important issue.
6	Water Quality Management in Urban Rivers	Jakarta (Balai DIKLAT III Jakarta)	4 days, Sep. 27th-30th, 2016	Understand more about: - Water Pollution Control Policy - Water Quality Monitoring and Management	Number: 23 Organization: BJBWS, BMSDA Kota, DBM Kota, PT II.	From Indonesia side - Water Pollution Control Policy, by Ir. SPM Budisartono, MSc. - Water Quality Monitoring, by Ir. SPM Budisartono, MSc. - Effluent Control Policy, by Ir. SPM Budisartono, MSc. - Response for water quality problem, by PT II. - Water quality management at Cilungur River, by BJBWS CI Cs From Japan side - Water Pollution Control Policy and Management - River Water Quality Management Policy	Topic - Technical mechanism of water treatment - O/M of the plant - Slides - Waduk Setia Budi - Waduk Melati	Average score of questions on Legal Framework were lower than score of other topics	"Monitoring water quality" in the field of Flood Management was raised as an important issue.
7	Operation and Maintenance for Irrigation	Surabaya (Balai DIKLAT Surabaya)	4 days Oct 18th to 21st	Understand more about: - Water Distribution Planning and Operation - Operation & Maintenance of Irrigation - Water User Coordination	Number: 26 Organization: BJBWS, BMSDA/DBM Provinsi dan Kab, PT I.	From Indonesia side - Legal Aspect and Current Status of O/M of Irrigation, by Ir. Dito, Sp. I. - Water Distribution for Agriculture Products, by Ir. Dito, Sp. I. - O/M of Irrigation Dam, by Mr. M. Adek Rialdi, ST, M.Tech. - O/M Works of Irrigation as Regulator by BJBWS Brantas, From Japan side - Operation and Maintenance of Irrigation	Topic - Operation method for water distribution - Hydrological data observation, monitoring and sharing - Coordination with stakeholders - Site - Bendung Lengking Baru - Delta Brantas Irrigation Area	Average score of questions on Irrigation Control System were lower than score of other topics	"Water Allocation Planning" in the field of Flood Management was raised as an important issue.
8	River Rehabilitation	Jakarta (Balai DIKLAT III Jakarta)	4 days, Nov. 15th-18th, 2016	5-year strategic plan of PUPH 2015 - 2019 - Rehabilitation of Structures, dyke, drainage system and so on". Knowing better about: - Legal aspect - Technical points for investigation/design	Number: 23 Organization: BJBWS, Dinas Tata Air Jakarta, PT II.	From Indonesia side - Natural Disaster and Management Policy, by Mr. M. Robi Amri - Emergency response policy flood, by Ir. Muhammad Asdin Thalib, MT - River information/warning, by Dr. Elia Nugraha A., ST, MPM, PDS - Emergency response for flood, by Ir. Bastari, M.Eng. BJBWS CI Cs, From Japan side - Technical points for investigation/design of River Rehabilitation - Operational and Disaster Risk Reduction by RBD in Japan - Legal system for Rehabilitation of Disaster-Stricken Public Facilities, and Engineering restoration work method for "Build Back Better"	Topic - River Channel Improvement - Site - Rehabilitation - Kumpang Pulo, Cilungur River - Situ Gunung	Average score of questions on Legal Framework were lower than score of other topics	"Emergency Response" and "Rehabilitation Work" in the field of Flood Management was raised as an important issue.



Photo 2.1.15 Training in 2016

2) Training in 2017

JICA Project submitted the Annual Training Plan 2017 on June 2016. The plan was approved at 2nd PIU meeting on 19th December 2016.

Initial plan submitted from the Project had five (5) training. However, it was suggested to combine training on “Self-Assessment of Benchmarking” and “Peer Review of Benchmarking” into one. Then, the combined one became “Assessment of BBWS's Performance for Benchmarking”. As a result of discussions with PIU, PUSDIKLAT and the Project, the Annual Training Plan in 2017 was finalized as four (4) Training. Table 2.1.32 shows a result of the training in 2017.



Photo 2.1.16 Training in 2017

Table 2.1.32 Result of Training in 2017

No.	Title	Venue	Duration	Objectives	Participants	Lectures and Lecturers	Field Study	Result of Test	Questionnaire
1	Assessment of BBWS Performance for Benchmarking	Solo (Bab Dinkat Yogyakarta)	5 days, 13-17 March, 2017	5-year plan of PUPR mentions that target score of RBO Performance Benchmarking is 4.0 Official document by DCS of SDA on benchmarking, 30 November 2015, describes that 1) One criteria will be added, 2) Self Assessment and Peer Review should be implemented Understanding on practical method of self assessment and peer review	Number: 39 Organization: BBWS, PRT	From Indonesia side - Introduction of RBO Performance Benchmarking Activity by Nur Widayati, Sp. L, MT - Explanation on NABRO and RBO Performance Benchmarking by Herman Dosis, CES - Explanation on Guideline of RBO Performance Benchmarking by Darsono, ME - Implementation of RBO Performance Benchmarking at BBWS Sengawan Solo by - Introduction of Performance Benchmarking Instrument (15 indicators) and its Utilization also Explanation on Action Plan by Y. Ionggrono, CES - Exercise 1. Self assessment by Y. Ionggrono, CES, Y. Herdanti Bambang Triandono - Exercise 2. Peer Review on the Result of Exercise by Darsono, ME, Dita Sami From Japan side - Implementation of RBO Management in Japan by Mura Hirohisa, ME	Topic - River improvement with stakeholders coordination - Sites - Adu Page	Topics in this test is necessary knowledge as a peer reviewer Result of the test including assessment by Balai Dinkat Satisfy: 5 persons Very Good: 16 persons Good: 15 persons Fail: 3 persons	
2	Sediment Management for Dam	Yogyakarta/Solo (Bab Dinkat Yogyakarta)	5 days, 17-21 April, 2017	5-year Plan of PUPR includes 65 dam construction projects Some of existing dams have been faced to severe sedimentation Understanding practical countermeasure for dam reservoir sedimentation	Number: 24 Organization: BBWS, Dina PUPR (Provinsi dan Kota, PRT II)	From Indonesia side - Law, Regulation and Technical Guideline, by Mr. Adek Ruzidi, ST, MT - Planning & Design of Structural Measures for Sediment & Landslide by Ir. Chandra Hana Didi, Ir. M. S. PMA Mechanism of Sediment transport and bathymetric survey by Wihay Musaka, ST Planning & Design of Water Intake Facility and Spillway / Gates by Ir. Dwi Istikomanto, M. Eng & Banata Wael Rahwan, SSI Practical Site Works in BBWS Sengawan Solo by Ir. Imam Marjianto, Didi, HE Practical Sediment Management for Dam in Begawan Sida (Wongiri Dam) by Ir. Yudi Peradito, MM From Japan side - Sedimentation of Dam and Countermeasures in Japan by Mura Hirohisa, ME	Topic - Subo Dam - Site - Sediment Management at Dam - Gerdor River and Auth River - Wongiri Dam	Topics on the Test: - Legal Framework - Basic definition and knowledge on Subo - Sediment Mechanism in Dam Reservoir - Countermeasures on Sedimentation for Dam - Planning and Design of Structural Measures for Sediment Topics with underline were lower score than other topics	"Environment Forest Conservation", "Planning design of check dam" and "Planning design of Subo Landslide protection, Subo dam" in the field of Sediment Management was raised as an important issue.
3	Calculation of Water Balance for Water Allocation Planning	Semarang (Bab Dinkat Yogyakarta)	4 days, 22-25 August, 2017	New Water User Right System and Water Service Fee System will be started, therefore Water allocation is needed more adequately Learning and exercise on calculation of Water balance for adequate Water allocation implementation.	Number: 44 Organization: BBWS, Dina PUPR (Provinsi dan Kota, PRT II), PUPR Cipta Karya	From Indonesia side - Legal aspect and Technical Standard by Subarsono, CES - Basic knowledge and application on water balance calculation, by Prof. Dr. Widyaharsono M. Sc. - Water Balance Calculation, Ir. Supriyanto, MM - Exercise and analysis of water availability and demand, by Y. Widayati Sumawita - Example of Water Allocation Planning from Water Balance Calculation in Semarang City Area, by V. Untoro Kurniawan, ST, MM.	Topic - Water balance at dam - Water balance at weir - Water demand at DAM - Site - Halibarang Dam - Simongan Weir - PDAM Kota Semarang	Topics on the Test: - Legal Framework - Basic knowledge on Water Balance and Water Allocation - Water Balance Calculation Score of all topic were good, but calculation for BAAI (Annual Water Allocation Plan) was difficult for participants (result of exercise lecture)	"BAAI (Annual Water Allocation Plan)" and "BAAI (Detail Water Allocation Plan)" in the field of Water Balance Calculation was raised as an important issue.
4	River Facility Maintenance	Podang (Bab Dinkat Medan)	4 days, 12-15 September, 2017	5-year plan of PUPR mentions "River normalization and dike construction has been developed" at responsibility of BBWS/BWS on Flood Control Learning and exercise on practical design of river structures such as levee (dike), revetment, weir and ground sills	Number: 34 Organization: BBWS, Dina PUPR (Provinsi, Kabupaten dan Kota)	From Indonesia side - Law, regulation and technical standards, by Ibu Dian Kamila, ST, MT - Hydraulics in River Channel of Flood Time, by - Practical Planning & Design of Levee and Revetment, by Y. Bambang Warso, Didi, HE - Practical Planning & Design of Weir and Groundsill, by Y. Supriyanto, Didi, HE - Landscape Design (Environment-friendly), by Ir. Budi Setono, Didi, HE - Exercise of Planning & Design of River Facility From Japan side - Historical and Advanced River Facility Structures in Japan, by Mr. Jun Hayakawa, JCA policy expert on SDA	Topic - Planning and Design of weir, groundsills, revetment, levee and so on - Site - Groundsill Gate at Batang Arau - Kanan Banjir - Subo works at Batang Kuraji - Batang Anai - Jetty at river mouth of kanal banjir	Topics on the Test: - Legal Framework - Planning Design of Levee - Landscape Design for River Facility - River Channel Planning (Compound Cross Section) Topics with underline were lower score than other topics	"Hydrological Analysis for River Facility Planning" in the field of River Facility Structure Design Planning was raised as an important issue.

3) Training in 2018

PIU and the Project discussed on the Annual Training Plan in 2018 and came to the conclusion that the Project should concentrate more on the activities at two pilot project sites indicated in PDM such as "OJT activities for Capacity Development at BBWS Ciliwung Cisadane and BWS Sulawesi 1". Considering the needs of the training in certain field and the time, PIU and the Project team decided to hold two (2) training in 2018. The training, "Performance Assessment for Benchmarking", held in two

different locations, one for BBWS and BWS located in Western Region and the other is for ones in Eastern Region.

Having these training would contribute for the Activity 1-7 in PDM, “Evaluate regularly the capacity of the RBOs through the progress on implementation of CD plans including the training, and the daily work activities to the priority issues, by various methods such as interviews to the staff, existing RBO benchmarking indicators and job assessment”. The participants from Field Practice Sites (BBWS Ciliwung Cisadane and BWS Sulawesi 1) can contribute their learning to help their office to evaluate the capacity of their own RBO. Moreover, the training would be counted for one of the activities in PDM such as Activity 2-4 “Evaluate the capacity of RBOs periodically and improve the benchmarking mechanism, considering the method of existing benchmarking mechanism for RBOs and the outputs of 1-1 and 1-2, if necessary” and Activity 2-5 “Inspect the performance of CD activities for RBOs and reflect its result into the revised CD plans and the CD resources including the training materials and trainers”. Result of the Training is as follows;

Table 2.1.33 Result of Training in 2018, on Performance Assessment for Benchmarking

Venue	Organizer	Duration	Participants	Curriculum	Evaluation of Participants	Certification
Palembang City, South Sumatra	Balai DIKLAT Palembang	9 -13 April For 5 days	28 Participants	1. Understanding of NARBO and River Basin Organization 2. Performance Benchmarking 3. Integrated Water Resources Management (IWRM)	1: very satisfied 3: satisfied 7: very good 8: good 9: failed	11: Certificated a “Peer Reviewer”
Mataram City, West Nusa Tenggara	Balai DIKLAT Surabaya	16-20 April For 5 days	25 Participants	4. Self-Assessment Process and Action Plan 5. Indicator of critical work areas 6. Criteria of how to evaluate the achievement 7. Peer Review 8. Documentation/ Filing System	4: very satisfied 4: satisfied 7: very good 1: good 9: failed	15: Certificated a “Peer Reviewer”



Photo 2.1.17 Training in 2018

4) Result of Pre/Post Tests and Questionnaires and reflecting next annual training plan

Balai DIKLAT and JICA Project conducted a Pre/Post-Test and a Questionnaire on Water Resources Management Issues during the training. Results of Pre/Post Test were used for Evaluation of

Participants to see the understanding of the contents of the training and used as one of the factors to determine if the participant would be recognized as either “Peer Reviewer” or just who completed a benchmarking training only. This applied to all three (3) training for the kind such are “Assessment of BBWS's Performance for Benchmarking” on March 2017, “Performance Assessment for Benchmarking” for West Region on beginning of April 2018 and East Region on Middle of April 2018.

Moreover, the Project team analyzed the result of these tests to find out those lessons and topic in the training which a number of participants had low average score and realize these needs to be strengthened. These facts were discussed and put into the following years training topic.

The result of the Questionnaires to participants also used as one of the factors to decide what would be the most important issues that the participants want in Water Resources Management filed.

Table 2.1.34 Results of Pre/Post Test and Questionnaire of Training in 2016

Training	Pre/Post Test (Low Score Topic)	Questionnaire (Important Issues)
Dam O/M	<ul style="list-style-type: none"> Legal aspect Dam Safety Sediment Management 	“Sediment Management”
Water Allocation	<ul style="list-style-type: none"> Water Balance Calculation SIPPA Water Service Fee Water User Coordination 	“Water balance”
Flood Management	<ul style="list-style-type: none"> Early Warning System 	“Designing / building Structural Measures for Flood”
River Facility Maintenance	<ul style="list-style-type: none"> Legal Framework Database and Inventory 	“Database & Inventory Facility”
Maintenance for WR Infrastructures	<ul style="list-style-type: none"> Legal Framework Database and Inventory 	“Database & Inventory Facility”
Water Quality in Urban Rivers	<ul style="list-style-type: none"> Legal Frame Works 	“Monitoring river water quality”
Irrigation O/M	<ul style="list-style-type: none"> Irrigation Canal System 	“Water Allocation Planning”
River Rehabilitation	<ul style="list-style-type: none"> Legal Framework 	“Emergency Response” “Rehabilitation Works”

Table 2.1.35 Results of Pre/Post Test and Questionnaire of Training in 2017

Training	Pre/Post Test (Low Score Topic)	Questionnaire (Important Issues)
Assessment of BBWS's Performance for Benchmarking	<i>Pre/Post Tests conducted examining for certification as a peer reviewer</i>	
Sediment Management for Dam	<ul style="list-style-type: none"> Legal framework Countermeasures on Sedimentation for Dam Planning and Design of Structural Measures for Sediment 	“Environment/Forest Conservation” “Planning/design of check dam” “Planning/design of Sabo (Landslide protection, Sabo dam)”
Calculation of Water Balance	<i>None</i>	“RAAT (Annual Water Allocation Plan)” “RAAR (Detail Water Allocation Plan)”
Design of River Facility Structure	<ul style="list-style-type: none"> Legal framework River Channel Planning 	“Hydrological Analysis for River Facility Planning”

5) Short Term Experts for Activity 2-2

JICA Project invited several JICA Short Term Experts as resources persons of training for Activity 2-2.

Table 2.1.36 shows list of Short-Term Experts.

Table 2.1.36 List of Short-Term Experts for Training of Activity 2-2

Name	Organization in Japan	Responsibility	Training
SUGIURA Masahiro	Japan Water Agency	Dam Facility Operation & Maintenance	Dam Operation & Maintenance in Malang City on 2-5 Feb. 2016
OCHI Yasuhiro	Japan Water Agency	Water User Coordination / Irrigation Water Allocation	Water Allocation in Makassar City, on 23-26 Feb. 2016
MORIYAS U Kunihiro	Japan Water Forum	River Maintenance	River Facility Maintenance in Jakarta, 9-12 Aug. 2016
OZAWA Morio	Ministry of Land, Infrastructure, Transport and Tourism	River Rehabilitation	River Rehabilitation in Jakarta on 15-18 Nov. 2016



Photo 2.1.18 Short Term Experts for Activity 2-2 at Training

Upper Left: DR. Sugiura is giving a lecture on Telecommunication Facility Maintenance at Dam O/M Training in Malang, Feb. 2016.

Upper Right: Mr. Ochii is making a lecture on Water Allocation for Irrigation at Water Allocation Training in Makassar, Feb. 2016.

Lower Left: Mr. Moriyasu is explaining on River Maintenance at River Facility Maintenance in Jakarta, August 2016, **Lower Right:**

Mr. Ozawa is talking about river rehabilitation after disaster at River Rehabilitation Training in Jakarta, Nov. 2016

6) Seminar that cooperated with Indonesia Commission on Large Dam (INACOLD)

JICA Project conducted a seminar as Focus Group Discussion as one of the events in Annual INACOLD Seminar in Batam City, Riau Islands Province on 24th Oct. 2018 on “Innovation and latest technology for Dam Operation and Maintenance”.

➤ **Background**

JICA Project held a seminar on Dam Operation & Maintenance in Manado on 25th April 2018, as Activity 1-6 for BWS Sulawesi 1. Topics of presentation by Mr. Maruyama Jun, JICA Short Term Expert (Director of Water Management, Division of River Environment, Water and Disaster Management Bureau, MLIT Japan) were 1) Dam Upgrading under Operation and 2) New Guideline on Sediment Management at Dam Reservoir. It was effective for not only BWS Sulawesi 1 but also all BBWS/BWS. Therefore, Project Director and PIU requested a seminar on same topic for all BBWS/BWS. Director General of Water Resources, Project Supervisor, suggested the seminar should be held in INACOLD Seminar. Therefore, JICA Project conducted the seminar as one of the Activity 2-2.

➤ **Agenda**

Figure 2.1.13 shows the agenda of the Focus Group Discussion on “Innovation and latest technology for Dam Operation and Maintenance”.

➤ **Participants**

- -Number of Participants: Around three hundred (300)
- -Institution:
 - Director General of Water Resources, PUPR
 - All BBWS and BWS in Indonesia
 - PJT 1, PJT2 and PLN, state enterprises on Dam Management
 - Seniors from Dam Safety Commission
 - Professors from Universities
 - Consultants and Contractors for Dam Constructions Project
 - DOISP (Dam Operational Improvement Safety Project) by World Bank
 - And others

➤ **Resources Persons and Presentations**

- Mr. HISHIDA Akira, JICA Short Term Expert (Director for Engineering Coordination, Kanto Regional Development Bureau, MLIT) on Dam Upgrading under Operation and Sediment Management at Dam Reservoir
- Mr. OJIMA Satoshi, Director, Water Resources Engineering Department, Japan Water Agency on Practical Dam Operation & Maintenance


 <p>Ministry of Public Works and Housing, Republic of Indonesia The Indonesian National Committee on Large Dams JICA: The Project on Capacity Development for RBOs in IWRM in Indonesia (Phase 2) THE WORLD BANK: Dam Operational Improvement / Safety Project</p>		
<p align="center">Agenda of Focus Group Discussion in INACOLD</p> <p align="center">“Innovation and latest technology for Dam Operation and Maintenance”</p> <p>Date : 14:00 - 17:00, 24th October 2018 (Wednesday) Venue : Cyprus Room, Aston Batam Hotel & Residence, Batam City, Riau Islands Province Chairperson : Ir. Agung Djuhartono, CES, Director of Operation & Maintenance, Directorate General of Water Resources, PUPR Moderator : Ir. Agus Suprpto Kusmulyono, M. Eng, PhD</p>		
Time	Contents	Presenter
Opening Ceremony		
14:00 - 14:10	Opening Remark	Ir. Agung Djuhartono, CES, Director of Operation & Maintenance, Directorate General of Water Resources, PUPR
14:10 - 14:20	Introduction of the Group Discussion and JICA Project	Mr. MIURA Hirohisa, JICA Project Expert
Presentation		
14:20 - 15:05	New Vision to Upgrade Dams under Operation and Guideline on Sediment Management by MLIT Japan -MLIT's Vision to Upgrade Dams under Operation -Latest Guidelines/Manuals on Dam O/M and New Guideline on Sediment Management for Dam Reservoir	Mr. HISHIDA Akira, JICA Short Term Expert (Director for Engineering Coordination, Kanto Regional Bureau, MLIT Japan)
15:05 - 15:20	Discussion	
15:20 - 15:50	Practical Operation and Maintenance for Dam in Japan -Special Operation for Flood Control -Comprehensive and Periodical Inspection for Long-Life of Dam -Practical Countermeasures for Sedimentation	Mr. OJIMA Satoshi, Director, Water Resources Engineering Department, Japan Water Agency
Discussion & Conclusion		
15:50 - 16:50	Discussion & Conclusion -“Innovation” in Indonesia and “Dam Upgrading” in Japan - Suggestions on Cooperation between Indonesia, DOISP and Japan for Dam OP	Moderator: Ir. Agus Suprpto Kusmulyono, M. Eng, PhD
Closing Ceremony		
16:50 - 17:00	Closing Remark	Ir. Agung Djuhartono, CES, Director of Operation & Maintenance, Directorate General of Water Resources, PUPR

Figure 2.1.13 Agenda of Focus Group Discussion on “Innovation and latest technology for Dam Operation and Maintenance” at INACOLD Seminar

Activity 2-3.

Establish Project Implementation Unit (PIU) to supervise the PDCA cycle of CD activities and coordinate the needs of RBOs on CD.

PIU was established officially in December 29th, 2015 by Ministerial Decree, No.683/KPTS/M/2015. The Decree has been updated on August 15th, 2017, No.542/KPTS/M/2017, due to changing membership.

Summary of description on the updated Decree is follow.

1. *Establishment of the Implementation team for Capacity Development of BBWS / BWS in the management of water resources. The team consists of Directors and Managers.*
2. *Task of the Director:*
 - *Provide guidance to implementer / Manager and JICA Expert Team.*
 - *Give suggestions, feedback, and recommendations related to capacity development plan BBWS / BWS.*
 - *Coordinate with related parties*
 - *Attend the JCC Meeting.*
3. *Task of the Manager:*
 - *Implement the Capacity Development for BBWS / BWS*
 - *Coordinate with relevant work units within the Directorate General of water resources*
 - *Discuss the implementation of the activities carried out by JICA Expert Team*
 - *Discusses the report of the JICA Expert Team work*
 - *Prepare meetings, workshops, and training*
 - *Attend regular meetings every 3 months*
4. *All costs incurred, charged to the Budget Implementation List (DIPA) unit of the Directorate of Water Resources Management in the budget 2017 – 2019*
5. *The Decree was signed by the Minister of Public Works and Housing on August 15, 2017 in Jakarta.*
6. *By the signing of this new decree, the previous decree (No. 683/KPTS/M/2015, signed by the Minister on December 29, 2015) is no longer valid and withdrawn.*



Figure 2.1.14 Ministerial Decrees on Establishment of PIU

Left: 1st Decree, No.683/KPTS/M/2015, **Right:** Updated Decree, No.542/KPTS/M/2017

Activity 2-4.

benchmarking mechanism, considering the method of existing benchmarking mechanism for RBOs and the outputs of 1-1 and 1-2, if necessary.

1) Evaluate the capacity of RBOs periodically

Sub-dit of Water Resources Institution, Directorate of Water Resources Management, Directorate General of Water Resources, as a responsible agency for Benchmarking has monitored and instructed Benchmarking, Self-Assessment / Review and Peer Review to all BBWS and BWS. Table 2.1.37 shows list of Benchmarking Score of each BBWS and BWS as of November 2018. Some of the BBWS and BWS have not conducted the Benchmarking every year. However, more than half BBWS and BWS have conducted the Benchmarking every year.

Table 2.1.37 Benchmarking Score of All BBWS and BWS, as of November 2018

BBWS, BWS	2015	2016	2017	2018
BBWS Bengawan Solo	3.23	3.37	3.37	3.37
BBWS Brantas	3.13	2.97	3.27	3.27
BBWS Citanduy	3.03	3.17	3.03	3.17
BBWS Cimanuk Cisanggarung	3.17	3.20	3.17	3.17
BBWS Cidanau-Ciujung-Cidurian	3.00	3.10	-	-
BBWS Pemali Juana	3.03	3.07	3.17	3.20
BBWS Ciliwung Cisadane	2.60	3.03	3.00	3.17
BBWS Pompengan Jeneberang	2.57	3.00	3.03	3.20
BBWS Citarum	2.03	2.80	3.50	3.53
BBWS Sumatera VIII	2.90	2.83	2.83	2.90
BBWS Mesuji Sekampung	2.40	2.93	2.93	3.03
BBWS Serayu Opak	2.47	2.87	2.80	3.03
BWS Sumatera I	2.27	2.81	2.90	3.03
BWS Sumatera II	2.23	2.40	2.57	2.93
BWS Sumatera III	1.60	1.60	-	-
BWS Sumatera IV	2.00	2.63	2.53	2.93
BWS Sumatera V	2.23	2.36	2.60	2.83
BWS Sumatera VI	2.77	2.80	2.80	2.87
BWS Sumatera VII	3.00	2.90	2.90	3.13
BWS Kalimantan I	2.53	2.23	2.63	2.80
BWS Kalimantan II	2.33	2.67	2.80	2.97
BWS Kalimantan III	2.70	2.17	2.80	3.00
BWS Sulawesi I	2.67	2.77	2.97	3.13
BWS Sulawesi II	2.00	2.23	2.03	2.67
BWS Sulawesi III	2.60	3.03	2.77	2.80
BWS Sulawesi IV	2.30	2.23	2.67	2.87
BWS Bali Penida	2.87	2.60	2.63	3.07
BWS Nusa Tenggara I	2.97	3.00	3.13	3.27
BWS Nusa Tenggara II	2.40	2.23	3.00	3.20
BWS Maluku	2.23	2.00	-	-
BWS Maluku Utara	1.60	2.90	2.70	3.00
BWS Papua	2.23	2.10	2.17	2.37
BWS Papua Barat	2.17	3.20	2.57	2.63
BWS Papua Merauke	-	-	-	0.97

2) Improve the benchmarking mechanism

Regarding on improvement of benchmarking mechanism, most essential thing is to make enough understanding of benchmarking knowledge and secure enough number of certificated peer reviewers.

PUPR already issued a Guideline on Benchmarking. Sub-dit of Water Resources Institution, Directorate of Water Resources Management, as a responsible agency for Benchmarking has monitored and instructed Benchmarking, Self-Assessment / Review and Peer Review to all BBWS and BWS. However, some of the BBWS and BWS had not conducted the Benchmarking due to lack of human resources for Benchmarking.

Therefore, JICA Project conducted three (3) training on Benchmarking, 1) Performance Assessment of BBWS and BWS by Benchmarking, in Solo city on March 2017, 2) Performance Assessment for BBWS and BWS in West Region, in Palembang City on April 2018, 3) Performance Assessment for BBWS and BWS in East Region, in Mataram City on April 2018. As results of the training, sixty-two (62) peer reviewers for Benchmarking could be certificated.

Table 2.1.38 Result of the training for peer reviewer development

Training	Venue	Duration	Evaluation of Participants	Certificate participants as the peer reviewer
Assessment of BBWS's Performance for Benchmarking	Solo City (Balai DIKLAT Yogyakarta)	5 days, 13 -17 March, 2017	Satisfied: 5 participants Very Good: 16 participants Good: 15 participants Failed: 3 participants	36/39
RBO Performance Benchmarking for BBWS and BWS in West Region	Palembang City (Balai DIKLAT Palembang)	5 days, 9 -13 April, 2018	Very satisfied: 1 participant Satisfied: 3 participants Very good: 7 participants Good: 8 participants Failed: 9 participants	11/28
RBO Performance Benchmarking for BBWS and BWS in East Region	Mataram City, Lombok, (Balai DIKLAT Surabaya)	5 days, 16 -20 April, 2018	Very satisfied: 4 participants Satisfied: 4 participants Very good: 7 participants Good: 1 participant Failed: 9participants	15/25
Total				62/92



Figure 2.1.15 The Certification as a Peer Reviewer for Benchmarking

Activity 2-5.

Inspect the performance of CD activities for RBOs and reflect its result into the revised CD plans and the CD resources including the training materials and trainers.

JICA Project had implemented fourteen (14) training for all BBWS and BWS on Water Resources Management. In the training, JICA Project cooperated with Balai DIKLAT of HRDA conducted Pre/Post Tests and Questionnaires. The results of the Tests and Questionnaires had been reflected next year Training Plan.

The Pre-test conducted at beginning of the Training; the Post Test conducted at end of the training. Contents and test questions come from lecture materials. The test is adequate for measuring improvement of training participants' knowledge and current knowledge level. Therefore, topics with low score in the Post Test can be candidate topics for next CD Plan to develop capacity more and more.

Table 2.1.39 shows detail result of Pre/Post Tests at the training 2016 and Table 2.1.40 shows detail result of Questionnaires at the Training 2016. Figure 2.1.16 shows summary result of Pre/Post Test of Training on Water Allocation in 2016 and Figure 2.1.17 shows example of Pre/Post Test.

Table 2.1.39 Detail Result of Pre/Post Tests at the training 2016

Training	Test Contents	Score Rate	Remarks
Dam Operation & Maintenance	1) Legal Framework	66%	
	2) Facility Maintenance	83%	
	3) Dam Safety (Dam Body Observation)	76%	
	4) Water Balance of Reservoir	81%	

Water Allocation	5) Sediment Management	76%	Reflected to Training 2017
	1) Legal Framework	92%	
	2) Water Balance Calculation	68%	Reflected to Training 2017
	3) Water Allocation Planning	83%	
	4) SIPPA	56%	
	5) Water Service Fee	42%	
Flood Management	6) Water User Coordination	42%	
	1) Legal Base of Flood Management	59%	
	2) Early Warning System	40%	
	3) Structural and non-Structural Measures	59%	Reflected to Training 2017
	4) Disaster Management Plan	78%	

*Test Contents with Red Color were candidate topic for next training

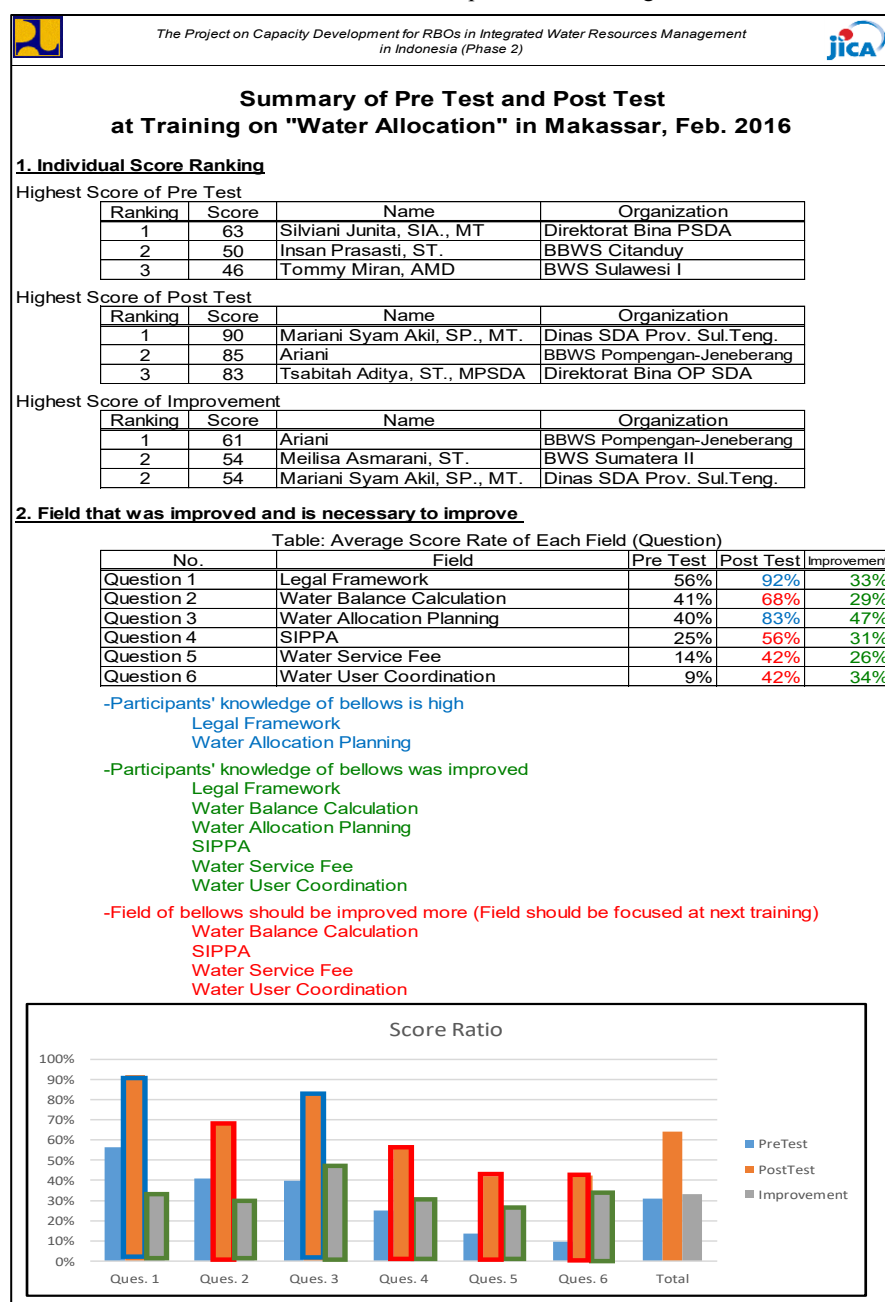




Figure 2.1.16 Summary of Pre/Post Test at Training on Water Allocation, Makassar on Feb. 2016



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3. Structural and Non-Structural Measures for Flood (24 Points = 4 points * 6 Answers)

Choose suitable Structural (River Measures/Basin Measures) and Non-Structural Measures from box below, and fill in descriptions (purpose, effect and others) on each measures.

Early Flood Warning, Dam/Reservoir, Irrigation Canal, Disaster Management/Operation Planning, Riverbank/Embankment, Water Allocation Planning, River Channel Improvement, SIPA (Water Use Permit), Flood Hazard/Risk Mapping, Flood Fighting Activity, Hydropower Station, Floodway (Diversion Channel), Retarding Basin, Retention Pond, Forest Conservation, Rainwater Storage/infiltration Facility, Awareness Raising of Local Residents, Land Use Management, Groundwater Management, Resettlement of Houses in River Area

Structural Measures (River Measures)

Name of Measures: _____

Description: _____

Name of Measures: _____

Description: _____

Structural Measures (Basin Measures)

Name of Measures: _____

Description: _____

Name of Measures: _____

Description: _____

Figure 2.1.17 Example of Post Test at Training on Flood Management on May 2016


Table 2.1.40 Detail result of Questionnaires at the Training 2016

Training	Topic	Rate	Remarks
Dam Operation & Maintenance (26 Participants)	Legal Aspect	8/26	
	Law Water Management	8/26	
	Flood Control	7/26	
	Facility Maintenance	8/26	
	Dam body Observation	7/26	
	Sediment Management	9/26	Reflected to Training 2017
Water Allocation (26 Participants)	Legal Aspect	3/26	
	Water Balance Calculation	11/26	Reflected to Training 2017
	SIPA (Water Use Permission)	5/26	
	Water Allocation Planning	10/26	
	Water Service Fee Collection	3/26	
	Water User Coordination	2/26	
	Operation for Water Distribution	3/26	
Flood Management (31 Participants)	Legal Aspect	5/31	
	Flood Warning System	5/31	
	Hydro-meteorological Observation	7/31	
	Master Planning of Flood Management	6/31	
	Disaster Management Planning	4/31	
	Stakeholder Coordination	6/31	
	Designing/Constructing Structural Measures for Flood	14/31	Reflected to Training 2017


*Test Contents with Red Color were candidate topic for next training

When JICA Project made the Annual Training Plan of 2017 on July 2016, three (3) training, Dam Operation & Maintenance, Water Allocation and Flood Management, had been implemented. Therefore, results of the Tests and Questionnaires of the three training could reflect to the Annual Training Plan 2017.

Figure 2.1.18 shows the Questionnaire Sheet and Table 2.1.41 shows relations between result of the Test/Questionnaires and training topics in 2017.



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Questionnaire from JICA Project

The project is for four (4) years of the trainings on Water Resources Management. We would like to hear from you and know the difficulty of your work to reflect our planning of future trainings.

Question 1:

Which part on Water Allocation is it important for your work? Please choose suitable part and fill the reason and description below.

Part: Legal Aspect, Water Balance Calculation, SIPA (Water Use Permission), ,
Water Allocation Planning, Water Service Fee Collection,
Water User Coordination, Operation for Water Distribution
Other ()

Reason, Description: _____

Question 2:

Which field on Water Resources Management is it important for your work or your office? Please choose suitable field and fill the reason and description below.

Part: Hydrology, Water Allocation, Flood Management, River Area Management,
Dam Operation & Maintenance, River Operation & Maintenance,
Water Quality Management, Swamp Management, Facility Maintenance,
Public Participation, Stakeholder Coordination,
Other ()

Reason, Description: _____

END

Figure 2.1.18 Example of Questionnaire at Training on Water Allocation on Feb. 2016

Table 2.1.41 Training in 2017 that Topics was reflected from result of Pre/Post Tests and Questionnaires of Training in 2016

Training	Contents	Reflected from
Sediment Management for Dam	<ul style="list-style-type: none"> – Law, Regulation and Technical Guidelines – Planning & Design of Structural Measures for Sediment & Landslide – Mechanism of Sediment transport and Bathymetric Survey – Planning & Design of Water Intake Facility and Spillway / Gates – Practical Sabo Works in BBWS Serayu-Opak – Practical Sediment Management for Dam in Bengawan Solo (Wonogiri Dam) – Sedimentation of Dam and Countermeasures in Japan 	<p>“<u>Sediment Management for Dam</u>”</p> <p>Results of Pre/Post Test and Questionnaire at Training in Malang on Dam O/M 2016</p>
Calculation of Water Balance for Water Allocation Planning	<ul style="list-style-type: none"> – Legal aspect and Technical Standard – Basic knowledge and preparation on water balance calculation – Water Balance Calculation – Exercise and analysis of water availability and demand – Example of Water Allocation Planning from Water Balance Calculation in Semarang City Area 	<p>“Water Balance Calculation”</p> <p>Results of Pre/Post Test and Questionnaire at Training on Water Allocation in Makassar on Feb. 2016</p>
Design of River Facility Structures	<ul style="list-style-type: none"> – Laws, regulations and technical standards – Hydraulics in River Channel of Flood Time – Practical Planning & Design of Levee and Revetment – Practical Planning & Design of Weir and Groundsill – Landscape Design (Environment-friendly) – Exercise of Planning & Design of River Facility – Historical and Advanced River Facility Structures in Japan 	<p>“Structural and non-Structural Measure” result of Pre/Post Test and</p> <p>“Designing/Constructing Structural Measures for Flood” result of Questionnaire at Training on Flood Management in Manado on May 2016</p>

(3) Activity 3

Activity 3-1.

Make an inventory of the CD resources (e.g. training/ dissemination materials, and trainers).

JICA Phase 1 Project, namely Capacity Development for Practical Water Resources Management in Indonesia, created ninety (90) Modules and Fifty-five (55) Guidelines/Manuals. After completion of the Phase 1 Project, CRBOM and DUWRMT created several Modules. As total, One Hundred Eighteen (118) Modules and Fifty-five Guideline/Manual.

JICA Project (Phase 2) conducted collection of soft-data of all Modules and Guidelines/Manuals from CRBOM and DUWRMT in Solo city, Central Java Province. JICA Project made an Inventory of Modules and Guidelines/Manuals, including detail information, such as Summary (Abstract), Contents, Based Standard and References for each.

Table 2.1.42 and Table 2.1.43 show one part of the Inventories.

Table 2.1.42 Inventory of Modules that JICA Phase 1 Project Created

List of Module (made by Phase 1 Project)				JICA Project on Capacity Development for RBOs in Integrated Water Resources Management in Indonesia (Phase 2)	
Total No.	Field	No.	Title	Abstract	contents
1	Hydrology	1	How To Use and Access Database and Information System Hydrology	This module provides the learning and the provision of knowledge to the participants of training, to know the technical specifications necessary to operate databases and hydrological information systems, and to know and understand the features available in the database and hydrological information system.	1. Introduction to Data Base and Information Systems 2. Install Software 3. Menu and Features Available 4. Surveillance Data
2		2	Calibration of Parameters on Hydrology Model	This module provides the learning and the provision of knowledge to the participants of training, to know and understand the concepts, methods and calibration applications, hydrological model, and can carry out the calibration of parameter of hydrology models.	1. Introduction 2. Overview of hydrology model 3. Flood forecasting model 4. Calibration of model
3		3	Hydrology Management No. 1	This module provides the learning and the provision of knowledge to the participants of training, to perform hydrological management in accordance with keeping good quality of hydrological management includes planning, hydrology network, post construction, and operation and maintenance of water resources management.	A. Introduction B. Program of management on hydrology C. Monitoring plan of hydrology network D. Development of hydrology stations E. Monitoring, operation and maintenance
4		4	How to input in the Data, Modify, Change and Input the Database and Hydrology Information System	This module provides the learning and the provision of knowledge to the participants of training, to know the technical specifications required in operate the database and hydrological information systems and to know and understand the features available in the database and hydrological information system.	1. Introduction on data base and hydrology information system 2. Installation of software 3. Menu and features 4. Key point of data management
5		5	Forecasting And Early Warning Flood	This module provides the learning and the provision of knowledge to the participants of training, to know and understand the concepts, methods and applications of flood forecasting and early warning, and can carry out the procedure flood forecasting and early warning in accordance field duties.	1. Introduction 2. Flood forecasting system 3. Flood warning system 4. Application of flood warning system and forecasting system
6		6	Database and Information System on Hydrology	This module provides the learning and the provision of knowledge to the participants of training, to know the technical specifications required in operate the database and hydrological information systems and to know and understand the features available in the database and hydrological information system.	1. Introduction on data base and hydrology information system 2. Installation of software 3. Menu and features 4. Data processing
7		7	Processing and Publication of Hydrology Data 1	This module provides the learning and the provision of knowledge to the participants of training, to perform the processing of hydrological data of the appropriate field with quality assurance of hydrological data that includes digitized with a variety of conditions and the availability of the data processing device soft in the regions / provinces, and understand the stages / quality control procedures (testing the quality) of hydrological data prior to publication, capable carry digitized graphics and hydrological data tabulation, (e.g. rainfall data, the data water level, temperature and humidity data, etc.)	A. Data processing and publication of hydrology system B. Digitization of graphics and data tabulation of hydrology data C. Validation of hydrology data
8		8	Operation and Maintenance of Database and Information System Hydrology	This module provides the learning and the provision of knowledge to the participants of training, to know and understand the concepts, methods and applications operation and updating of data base and information system hydrology.	1. Introduction 2. Operation of data base and hydrology information system 3. Renewal of data base and hydrology information system
9		9	Processing and Publication of Hydrology Data 2	This module provides the learning and the provision of knowledge to the participants of training, to be able to carry out the rating curve creation and modification (curved flow) and subsequent tables (tables with the relationship between water level and flow) either manually or by using a software.	D. Making and modification of Hydrological rating curve E. Making sediment rating curve
10		10	Processing and Publication of Hydrology Data 3	This module provides the learning and the provision of knowledge to the participants of training to be able to carry out hydrological data processing (data of rain, climate data and discharge data) either manually or by using computer software.	F. Processing data of rainfall, meteorology and hydrology G. Publication of data of rainfall, meteorology, hydrology and sedimentation
11		11	Analysis and Preparation for Hydrology Information	This module provides learning and the provision of knowledge to the trainees to perform analysis such as the analysis of rainfall on average rainfall, filling in the blanks, rain intensity analysis, and analysis of rain plan.	A. Analysis of rainfall data B. Analysis of flood management plan C. Analysis of discharge (flow rate) and water availability

Table 2.1.43 Inventory of Guidelines that JICA Phase 1 Project Created

Condition of Guideline / Manual							
Total No.	Field	No.	Title	contents	Based Standard	References	year
1	Hydrology	1	The Making of Guideline Revision / Operation Manual and System Maintenance	1. Introduction to Data Base and Information Systems 2. How to Install Software 3. Menu and Features Available 4. Displaying Data 5. Key In Data 6. Data Processing	1. Act No. 7 of 2004 on Water Resources 2. Government Regulation No.42 of 2008 on Water Resources Management		2010
		2	Guideline of Water Use Right	1. Introduction 2. Definition and Concept on Water Right 3. Concept of Guideline for Licensing Water Right 4. Problems in Implementation of Water Right 5. Institutional Management Principles of Water Right 6. Conclusion	1. Law No. Regulation 5 of 1960 2. Law No. 11 of 1974 on Irrigation (repealed by Act No. 7 of 2004 on Source Water Resources) 3. Law No. 7 2004 About Water Resources 4. Government Regulation No. 22 of 1982 on water resources management (repealed with PP No.42 of 2008 on Water Resources Management), 5. Regulations 20 Government of 2006 on Irrigation 6. Government Regulation No. 42 2008 on Water Resources Management 7. Law No. 7 of 2004 on Water Resources 8. Law No. 11 of 1974 on Water, arrangements for water resources management, among others, realized through the Right to Water 9. The provisions of Article 1 number 13 the Law No. 7 of 2004 gives sense of Right to Water as the right to obtain and use or speling water for various purposes	1. Act R.L. No. 7, 2004, on Water Resources. 2. Government Regulation No.42, 2008, on the Management of Resources Air Power 3. Government Regulation No.20, 2006, concerning Irrigation. 4. Imam Ansoni 2004, Conception of Water Resources Management, according to Law No.7 of 2004, the paper Dep Kipraswall. 5. Robert J.Kofoote, Dr. Ir. M.Eng. & M. Basoeeki, Dr. Ir. M.Sc., Study Law No. 7, 2004, on Water Resources. 6. Tre M. Sunaryo, Ir. M. Eng. Tjok Waluyo S. Ir. CES, Aris Hamanto, Ir. Diji H.E., Water Resources Management, Concepts and implementation, 2005. 7. Draft Regulation About the Right to Water, Paper 8. Soharjo Sarwan, Ir. M.Sc., February 2009, Framework Setup Right to Water in Indonesia and its correlation with the allocation of water, paper / Work shop 9. Waluyo Helmoko, Drs., M.Sc., November 2008, Management of Water Allocation in River region, the initial input material DUWRMT 10. Master Plan Study CDMP Th.2001, Development and Management of Natural Resources, Soto River region.	
3	River Basin Water Allocation Management	3	Guideline of Annual Water Allocation Plan	1. Introduction 2. Definition and Concept of Water Allocation Plan 3. Concept of Guideline on Annual Water Allocation Plan 4. Implementation Plan of Water Allocation 5. Institutional Coordination for Water Allocation Plan 6. Conclusion	1. Law 7, 2004, on Water Resources. 2. Government Regulation No. 42, 2008, on the Management Water Resources. 3. Government Regulation No.20, 2006, concerning Irrigation. 4. The initial concept of the Draft Regulation on the Right to Water 5. Water Allocation Guidelines (DG Watering Th.1998).	1. Act No.7 of 2004, About Water Resources. 2. Government Regulation 42 of 2008, on Water Resources Management 3. Government Regulation No.20 of 2006, About Irrigation. 4. Robert J.Kofoote, Dr. Ir. M.Eng & M.Basoeeki, Dr. Ir. M.Sc., Legal Studies No. 7 of 2004, About Water Resources. 5. Tre M. Sunaryo, Ir. M. Eng. Tjok Waluyo S., Ir. CES, Aris Hamanto, Ir. Diji H.E., Water Resources Management Concepts and Practice, in 2005. 6. Waluyo Helmoko, Drs., M.Sc., Water Allocation Management On Water Resources, Water Allocation Management Training Materials, in Natural Resources Research and Development, London, July 2009. 7. Directorate of Water, 1998, Water Allocation Guidelines. 8. Draft Ministerial Regulation P.U. Preparation of Water Balance and Implementation of Water Allocation. 9. The Secretary-General Education and Training Center, Department P.U., 2008, on Module Management of Natural Resources, First Appointment Functional Training, Technical Expert Level Irrigation. 10. Master Plan Study CDMP Th.2001, Development and Management SDA Regional Solo River.	2009
		4	Guideline of Detail Water Allocation Plan	1. Introduction 2. Definition and Concept of Water Allocation Plan 3. Concept of Guideline for Detail Water Allocation Plan 4. Institutional Coordination of Water Allocation Plan 5. Conclusion	1. Law 7, 2004, on Water Resources. 2. Government Regulation No.42, 2008, on the Management Water Resources. 3. Government Regulation No.20, 2006, concerning Irrigation. 4. Allocating Water Guidelines (DG Watering Th.1998). 5. The draft Regulation of the Minister of Public Works, About the preparation of Water Balance and Operation of Water Allocation, Th.2008	1. Act No.7 of 2004, About Water Resources. 2. Government Regulation 42 of 2008, on Water Resources Management. 3. Government Regulation No.20 of 2006, About Irrigation. 4. Dr Ir Robert J.Kofoote, M.Eng & Dr Ir M.Basoeeki, Study of Law # 7 2004, About Water Resources. 5. M. Sunaryo Ir. Tre M.Eng. Ir Tjok Waluyo S., CES, Ir. Aris Hamanto Diji H.E., Water Resources Management Concepts and Practice, Th. 2005. 6. Drs. Waluyo Helmoko M.Sc., Water Allocation Management On Water Resources, Water Allocation Management Training Materials, Water Resources Research and Development, London, July 2009. 7. Directorate of Water, 1998, Water Allocation Guidelines. 8. Draft Ministerial Regulation P.U. Preparation of Water Balance and Implementation of Water Allocation. 9. Natural Resources Management Module, Functional Training Appointment First, Technics Irrigation expert level, in 2008, Secretary General Training Center, Department P.U. 10. Beni Mayasari, ST, M.Si, Planning for the Supply and Use of Water in Perum Jasa Tirta & Papes Training Water Allocation Planning, DUWRMT, London, July 2008. 11. Muhammad Firdaus, Guidelines for Water Allocation and Distribution Jeneberang River, Papers Training Water Allocation Planning, DUWRMT, London, July 2008. 12. Kusumartini, Ir., Diji He, Pattern Reservoir Operation and Water Allocation in the watershed time Brantas, Perum Jasa Tirta & Drought Th.2009, Training Papers Water Allocation Planning, DUWRMT, London, July 2008.	

Activity 3-2.

Implement a PDCA cycle mechanism to improve the reliability of the CD resources, utilizing CDF and the output of the CD activities.

1) Upgrade and Certification of Modules that JICA Project Phase 1 created

JICA Project Phase 1 created around one hundred (100) modules and around Fifty (50) guidelines. After Phase 1 finished, CRBOM and DUWRMT created several modules. As the total, one hundred eighteen (118) modules and fifty-five (55) guidelines are available.

These modules and guidelines are managed by PUSAIR, Research & Development Agency and PUSDIKLAT Konstruksi and SDA, HDRA. PUSAIR has carried out screening and inspection of the modules and guideline, which one should be certificated as official regulation, standard and training materials.

As of November 2018, ten (10) modules were already certificated or are processing to be certificated as SNI, Ministerial Regulation or Guideline, managed by PUSAIR and PUSDIKLAT. Table 2.1.44 shows the ten (10) modules' current status.

Table 2.1.44 List of the modules that were already certificated or is processing to be certificated as official regulation, standard or training material

Field	Module	Current Status
River Area Management	Management of Related Organization and Agency	Compiled as Ministerial Regulation 17/PRT/M/2017 on Guidelines for the establishment of TKPSDA at the river basin level
Dam Operation	Dam and its complementary structure	Compiled as Ministerial Regulation 27/PRT/M/2015 on Dam
	Dam Safety Concept	Referred for Revision of SNI (Standard National Indonesia) 03-1731-1989, Guideline for dam safety that have reached the RPT-3 stage (Consensus Meeting)
	Evaluation on Condition of Seepage at Fill-Type Dam	Referred for SNI 8065:2016 on analysis method and how to control water seepage for fill type dams
River Operation & Maintenance	Operation & Maintenance of River	Under compilation as Guideline on Water Resources Operation & Maintenance, Chapter on River by Sub-dit of River & Coast
	River Morphology Change Control	Under drafting as Guideline
Water Quality Management	Construction of OP-IPAL (Waste Water Treatment Plant)	Compiled as SNI 7847:2012 on Waste Water, Specification on Processing Result Part 1: Mud from Pulp and Paper Factories
Coastal Management	Observation of Tidal Flow at Coastal Area	Under discussion as Guideline
	Bathymetry Mapping of Topography at Coastal Area	Compiled as SNI 8283:2016 on Depth measurement method uses echo sounding to produce a bathymetry map Compiled as SNI 7988:2015 on bathymetry survey using multibeam echosounder
Geodetic	Horizontal Control Point Network	Compiled as RPT3 - technical specifications of measurement

2) Easy access to materials of JICA Project training on HRDA's website

It is mentioned that JICA Project conducted fourteen (14) training, eight in 2016, four in 2017 and two (2) in 2018. The training invited a lot of lecturers from various institution for valuable technical knowledge transfer to training's participants from a lot of BBWS and BWS in whole of Indonesia. Almost all lecturers prepared a lecture material by themselves. The materials are utility valuable reference for daily works at BBWS and BWS on Water Resources Management. Therefore, HRDA and JICA Project discussed that how to disseminate the materials to officials, engineers and technicians at all BBWS and BWS. As the result of discussion, both sides, HRDA and JICA Project reached the decision to open the materials at website of HRDA that everyone can access and download. It can be utilized and effective after JICA Project finished.

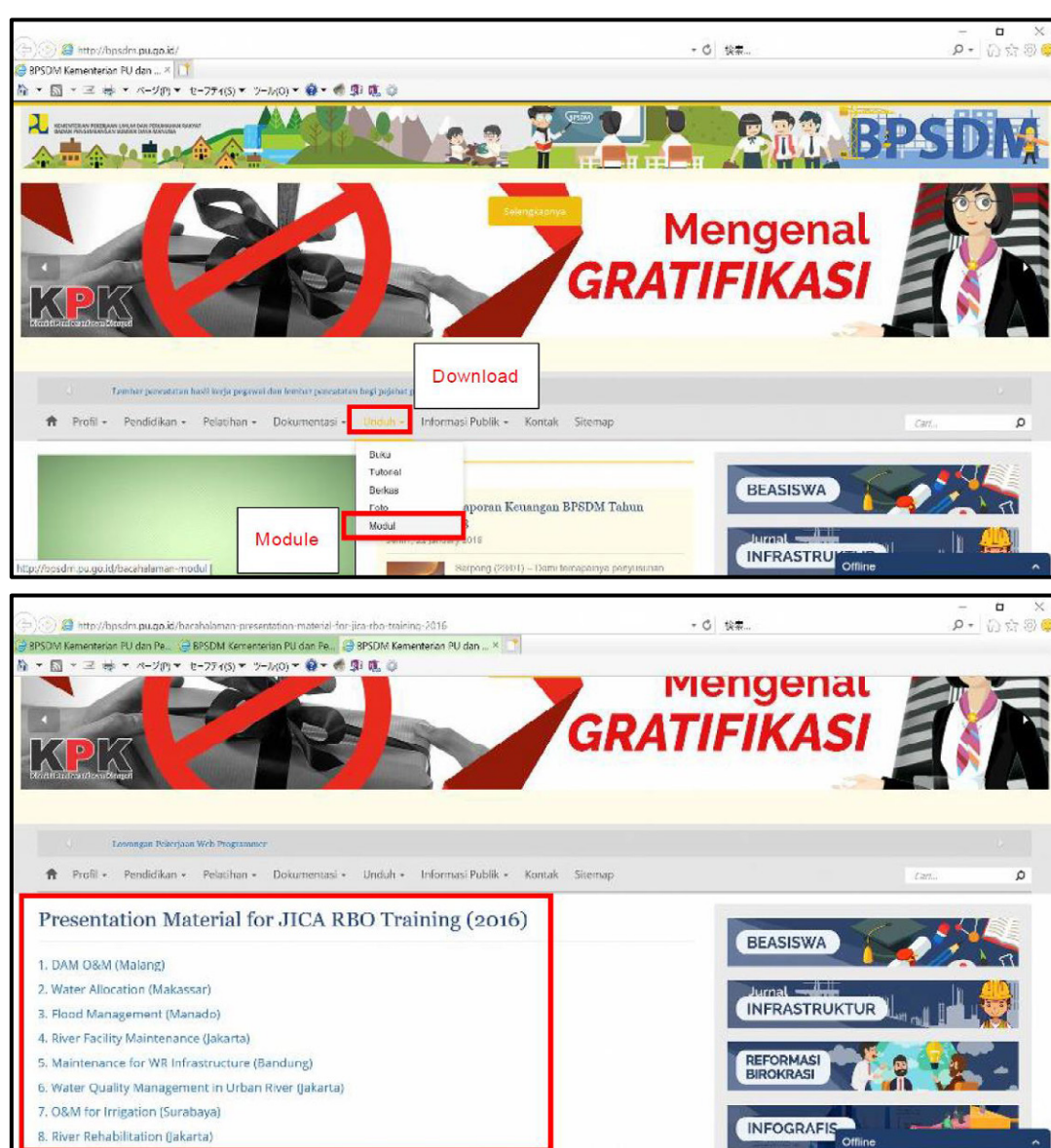


Figure 2.1.19 Website of HRDA to be able to access materials of JICA Project training

Upper one: Top page of HRDA website. Click “Download” and “Module”

Lower one: page that we can select training in 2016 to download materials

Activity 3-3.

Conduct workshops and seminars to promote and facilitate more effective and efficient use of CD resources.

Regarding on promotion and facilitation of CD Resources, JICA Project distributed all One Hundred Eighty-eight (118) Modules to all participants of all JICA Project training by soft-data. Totally we distributed the Modules at Fourteen (14) training to four hundred fourteen (414) participants.

Table 2.1.45 List of training and participants for dissemination of Modules

Training	Venue	Duration	Participants
2016			220
Dam Operation and Maintenance	Malang City (Balai DIKLAT Surabaya)	4 days, 2 – 5 Feb. 2016	26
Water Allocation	Makassar City (Balai DIKLAT Makassar)	4 days, 23 – 26 Feb. 2016	26
Flood Management	Manado City (Balai DIKLAT Makassar)	4 days, 10 – 13, May 2016	33
River Facility Maintenance	Jakarta (Balai DIKLAT III Jakarta)	4 days, 10 – 12 Aug. 2016	33
Maintenance for Water Resources Infrastructure (WRI)	Bandung (Balai DIKLAT Bandung)	4 days, 30 Aug – 2 Sep. 2016	30
Water Quality Management in Urban Rivers	Jakarta (Balai DIKLAT III Jakarta)	4 days, 27 – 30 Sep. 2016	23
Operation and Maintenance for Irrigation	Surabaya (Balai DIKLAT Surabaya)	4 days, 18 – 21 Oct. 2018	26
River Rehabilitation	Jakarta (Balai DIKLAT III Jakarta)	4 days, 15-18 Nov. 2016	23
2017			141
Assessment of BBWS's Performance for Benchmarking	Solo City (Balai DIKLAT Yogyakarta)	5 days, 13 -17 Mar. 2017	39
Sediment Management for Dam	Yogyakarta/Solo City (Balai DIKLAT Yogyakarta)	5 days, 17 - 21 Apr. 2017	24
Calculation of Water Balance for Water Allocation Planning	Semarang City (Balai DIKLAT Yogyakarta)	4 days, 22 - 25 Aug. 2017	44
Design of River Facility Structure	Padang (Balai DIKLAT Medan)	4 days, 12 - 15 Sep. 2017	34
2018			53
RBO Performance Benchmarking for BBWS and BWS in West Region	Palembang City (Balai DIKLAT Palembang)	5 days, 9 -13 Apr. 2018	28
RBO Performance Benchmarking for BBWS and BWS in East Region	Mataram City, Lombok, (Balai DIKLAT Surabaya)	5 days, 16 -20 Apr. 2018	25
Total			414

2.2 Achievements of the Project

2.2.1 Outputs and indicators

Table 2.2.1 Verifiable Indicators and Means of Verification for Outputs

Outputs	Verifiable Indicators	Means of Verification
1	1-1. Participating rate for training at the FP sites 1-2. Number of field training at the FP sites 1-3. Score of RBO benchmarking at the FP sites	1-1. Record of training 1-2. Record of training 1-3. Benchmarking study
2	2-1. Number of good practices and lessons learned applied to CDF through the project 2-2. Number of CD activities jointly implemented in accordance with Annual CD activity plan in PU 2-3. Recommendation to next Mid-term plans of CD in PU 2-4. Number of the Project Implementation Unit Meeting held	2-1. Questionnaire / Site survey to RBOs. Revised CD materials 2-2. Annual Work Plan of PU 2-3. Approved plans in PU 2-4. Record of PIU Meeting
3	3-1. Number of workshops and seminars conducted 3-2. Number of CD resources revised	3-1. Minutes of meeting of PIU 3-2. Minutes of meeting of PIU

Verifiable Indicator 1-1.

Participating rate for trainings at the FP sites

Working Team Member Lists at BBWS Ciliwung Cisadane and BWS Sulawesi 1 were identified at 3rd JJC Meeting on 12th April 2017. For calculation of “Participating rate for training at FP sites”, the calculation of the Rate is based on the Working Team Member List.

The Participating Rate is **60%** at BBWS Ciliwung Cisadane and **79%** at BWS Sulawesi 1. A level of the achievement is **“High”**.

Table 2.2.2 Participation of Working Team Member and Participating Rate at BBWS Ciliwung Cisadane

No.	Name	Position of BBWS	Participating	
1	Ms. Anggia Satrini	Head of Program & Planning Division	Y	Meeting on 28 Aug. 2018 and others
2	Mr. Baskoro	Head of Implementation Division	N	
3	Ms. Gemala Suzanti	Head of Operation & Maintenance Division	Y	Seminar on 30 Aug. 2018 and others
4	Ms. Ari Winarti	Program & Planning	N	
5	Ms. Vicie Puspasari	Program & Planning	Y	Data Collection
6	Ms. Sona Meylina	Implementation	N	
7	Ms. Anisa Sari	Operation & Maintenance	N	
8	Ms. Novita Sari	Operation & Maintenance	Y	Meeting on 11 Oct. 2018
9	Ms. Eka Siwi	Operation & Maintenance	Y	Meeting on 11 Oct. 2018
10	Ms. Ratih Ajeng	Operation & Maintenance	Y	Seminar on 30 Aug. 2018 and others
Participating Rate			6/10 (60%)	

Table 2.2.3 Participation of Working Team Member and Participating Rate at BWS Sulawesi 1

No.	Name	Position of BWS	Participation	
1	Djidon R. Watania, ST. MM	Head of BWS Sulawesi I	Y	Seminar on 14 June 2017 and others

2	Ellen D. Cumentas, ST. Sp.1	Section Head of Programs & General	Y	Seminar on 14 June 2017 and others
3	Audy H.P. Rantung ST. MT. Novie M. Ilat, ST.Sp.1 Ir. Herry C. Taliumpa, Sp.1	Planning BWS Sulawesi I Section Head of O & M BWS Sulawesi I	Y	Seminar on 14 June 2017 and others
4	Dan Ridley Namare, ST	Section Head of Implementation BWS Sulawesi I	Y	Seminar on 25 April 2018 and others
5	Immanuel F. Makasache, ST. Sp1	Functional officials	Y	Seminar on 14 June 2017 and others
6	Djahara Lobud, SE. MM	Commitment Making Official - Management	N	
7	Jacquelin L. Tahar, SH	Sub Division Head of Administrative	Y	Seminar on 14 June 2017 and others
8	Ir. Eddy Kenda, MSi	Functional officials	Y	Seminar on 15 August 2018, and others
9	Ir. Sardjon Welliang, MT	Functional officials	Y	Seminar on 14 June 2017 and others
10	Berty Gahansa, SH	Chief of Reviewers Officer	N	
11	Ronald F. Parengkuan, ST	Commitment Making Official of O&M 1 SDA Sulawesi I	N	
12	Drs. Ajub I. Kandou	Technical Implementation - Commitment Making - Management	N	
13	Revly Pasiowan, ST	Chief of Hydrology Reviewers	Y	Site Practice on 6-8 March 2018 and others
14	Frinny E.D Lele, ST	Chief of O & M Reviewers	Y	Field Seminar on 2-6 April 2018
15	Hendry Doodoh, ST	Administrative Coordinator of Dam Working Unit	Y	Seminar on 14 June 2017 and others
16	Rhecky J. Lontoh, ST	Technical Implementation - Commitment Making - General Planning & Programs Working Unit	Y	Seminar on 14 June 2017 and others
17	Tommy Miran, A.Md	Staff of Hydrology, O & M Working Unit	Y	Site Practice on 6-8 March 2018 and others
18	Youke M. Sumolang	Staff of BWS S1	Y	Seminar on 16 Oct. 2018 and others
19	Vonne C. Pangemanan, ST	Staff of BWS S1	Y	Meeting on 13 November 2018
Participating Rate			15/19 (79%)	

Verifiable Indicator 1-2.

Number of field trainings at the FP sites

Number of field training can be thought as Capacity Development Activity for Activity 1-6. It is mentioned at Table 2.2.4 List of activities for Activity 1-6 at BBWS Ciliwung Cisadane and Table 2.2.5 List of Activities at BWS Sulawesi 1.

Number of field training is **fifty-five (55)** which includes **thirteen (13)** at BBWS Ciliwung Cisadane and **forty-two (42)** at BWS Sulawesi 1. There is one (1) topic for OJT at BBWS Ciliwung Cisadane initially, but there are three (3) topics for OJT at BWS Sulawesi 1. The average number of training were conducted for a topic is 13.75 times per a topic. A level of the achievement is “**High**”.

Table 2.2.4 Capacity Development Activity for Activity 1-6 at BBWS Ciliwung Cisadane

No	Topic	Date	Activity Type	Contents
1	OJT	Feb. 20, 2018	Meeting	<ul style="list-style-type: none"> - Explanation to New Head o BBWS - Discussion and Confirm on Activity 1-1 to 1-6 with Head of BBWS
2	OJT	Mar. 14, 2018	Meeting	<ul style="list-style-type: none"> - Data Collecting on Water Allocation Planning Report at Cisadane River Through PIU Meeting
3	OJT	May 17, 2018	Meeting	<ul style="list-style-type: none"> - Check the existing report contents
4	Add. OJT①	May 17, 2018	Field Survey	<ul style="list-style-type: none"> - Site check at Situ Telaga Saat, upstream of Ciliwung River for Landscape Design and SAKURA Project
5	OJT	May 31, 2018	Meeting	<ul style="list-style-type: none"> - Confirm necessary data, if unavailable, we will conduct as an assumption calculation of Irrigation demands
6	OJT	Aug. 10, 2018	Meeting	<ul style="list-style-type: none"> - Explanation to New Head of BBWS - Additional topics for Project OJT
7	OJT	Beginning Aug. 2018		<ul style="list-style-type: none"> - Collecting the cultivation patter information from Kabupaten
8	Add. OJT①	Aug. 28, 2018	Meeting	<ul style="list-style-type: none"> - Confirm procedure and schedule of activity for Environment Conservation Project
9	Add. OJT②	Aug. 30, 2018	Seminar	<ul style="list-style-type: none"> - Discussion on Maintenance work for Situ Gintung (Rock-Fill Type Dam) - Site check on water leakage at downstream of Dam body
10	Add. OJT①	Aug. 31, 2018	Field Survey	<ul style="list-style-type: none"> - Check the available SAKURA for Telaga Saat at Cibodas Botanical Garden
11	Add. OJT①	Sep. 14, 2018	Seminar	<ul style="list-style-type: none"> - Head of BBWS chaired for the Seminar - Discussion on Concept and Kinds of SAKURA for Telaga Saat
12	Add. OJT①	Oct. 4, 2018	Seminar	<ul style="list-style-type: none"> - Introduction on River Works with Nature Conservation - Discussion on River Works without relocation of houses at river
13	OJT	Oct. 11, 2018	Discussion	<ul style="list-style-type: none"> - Self-Assessment Report of 2017 - Upgrading the Report Contents, especially "Action Plan"
Total: 13 times				

Table 2.2.5 Capacity Development Activity for Activity 1-6 at BWS Sulawesi 1

No.	Date	Activity Type	Contents
Common Activity for three (3) OJT Topics			
1	Jun. 14, 2017	Seminar	<ul style="list-style-type: none"> - Kick Off Seminar for three (3) OJT Topics - Confirmed Purposes, Schedule and Locations of the OJT
2	Nov. 13, 2018	Discussion	<ul style="list-style-type: none"> - Self-Assessment Report of 2017 - Upgrading quality of the Report Contents, especially "Action Plan"
3	Dec. 11, 2018	Seminar	<ul style="list-style-type: none"> - Wrap Up Seminar for three (3) OJT Topics - Summarized results and outputs of the OJT
1) Implement flow observation of high water and update H-Q formulation			
4	Mar. 7-8, 2017	Discussion, Field Activity	<ul style="list-style-type: none"> - Decided four (4) locations for High Water Flow Measurement, 1) Kairagi of Tondano River, 2) Tikala,

			3) Sario and 4) Malalayang - Decided "Float Method" as a method of the measurement
5	Apr. 6, 2017	Discussion, Field Activity	- Check the conditions of new relocated position of Kairagi and Malalayang - Setting cross section survey lines as float reference point (existing station), 1 st Measurement Line and 2 nd Measurement Line
6	May 3, 2017	Field Activity	- Instructing specifications and how to product the "Float" for High Water Flow Measurement at a Workshop
7	Jun. 6, 2017	Field Activity	- Check the available BMs for River Cross Section Survey at four (4) locations
8	Jul. 25-26, 2017	Discussion Field Activity	- Confirmed existing BMs at four (4) locations - Check the availability of necessary equipment for High Water Flow Measurement
9	Oct. 9-11, 2017	Discussion	- Made a draft TOR and Cost Estimation for River Cross Section Survey
10	Nov. 7-8, 2017	Discussion	- Finalized TOR of River Cross Section Survey, especially method and minimum accuracy of survey
11	Nov. 18-19, 2017	Discussion Field Activity	- Shared information on damage by flood, staff gauges at OJT locations washed away. JICA Project will repair it.
12	Dec. 18-19, 2017	Discussion Field Activity	- Site Conditions check for River Cross Section Survey
13	Jan. 9-11, 2018	Discussion Field Activity	- Progress check of River Cross Section Survey
14	Feb 12-13, 2018	Discussion Field Activity	- Check draft drawing of River Cross Section Survey at Office and Sites - Scheduled a site practice of High Water Flow Measurement on March 5-8, 2018
15	Feb. 26-27, 2018	Discussion Field Activity	- Check the output of River Cross Section Survey at Office and Sites - Preparation for Site Practice of High Water Flow Measurement
16	Mar. 6-8, 2018	Field Activity	- Site Practice on High Water Flow Measurement at Tondano, Tikala and Sario - Workshop on flow velocity and flow rate calculation
17	End of Mar. 2018	Field Activity	- Finished River Cross Section Survey at Tondano, Tikala and Sario by Survey Company
18	End of Mar. 2018	Field Activity	- Instruct on producing the Float to Local Workshop in Manado City for continuous supplying the Float to BWS Sulawesi 1
19	Apr. 25, 2018	Seminar	- Special Seminar on High Water Flow Measurement, support by Japanese short term experts from MLIT
20	May 23, 2018	Meeting	- Follow-up discussion for the Special Seminar, handing over a book on Hydrology Management in Japan "Illustration on Hydrology Observation"
21	Sep. 28, 2018	Field Activity	- Finished installation of Staff Gauges at Tikala, Sario and Malalayang for High Water Flow Measurement
2) Update / Create maintenance manual and conduct training for hydrological instrument			
22	Mar. 7, 2017	Discussion	- Decided a way of OJT, as purchase new AWLR and ARR for OJT
23	May 3, 2017	Field Activity	- Check candidate location to install new instrument,

			AWLR and ARR - Decided location to install 1) AWLR at Tikala, 2) ARR at Kuwil Kaloosan
24	Jun. 7, 2017	Discussion	- Deciding type of AWLR and ARR. AWLR is "Non-Contact (Ultra Sonic) Type" at Tikala, ARR is "Tipping Bucket Type" at Kuwil Kaloosan
25	Jul. 25-26, 2017	Field Activity	- Check the site condition in detail for procurement TOR and cost estimation at Tikala for AWLR and at Kuwil Kaloosan for ARR at Kuwil Kaloosan
26	Oct. 9-11, 2017	Discussion Field Activity	- Changed the type of AWLR, from "Non-contact type" to "Water Pressure Type" - Made a draft TOR of AWLR and ARR procurement
27	Dec. 18-19, 2017	Discussion	- Making TOR of AWLR and ARR procurement
28	Jan. 9-11, 2018	Discussion Field Activity	- Condition check for AWLR type - Condition check at Tikala for AWLR Type
29	Feb. 12-13, 2018	Discussion	- Sharing information on progress of ARR Procurement
30	Mar. 20-21, 2018	Field Activity	- Finished Installation of ARR at Kuwil Kaloosan, Tipping Bucket Type - Site Practice on Maintenance and Data Download by BWS Sulawesi 1
31	Apr.-May 2018	Meeting	- Several Discussion on TOR of AWLR at Tikala, Microwave (Non-Contact) Type
32	Aug. 1, 2018	Field Activity	- Finished Installation of AWLR at Tikala - Site Practice on Maintenance and Data Download by BWS Sulawesi 1
33	Oct. 16, 2018	Seminar	- Seminar on Specification & Maintenance for ARR and AWLR for Observers - Demonstration and Practice of Periodical Maintenance at Sites
3) Support for making O/M rule of Kuwil Dam			
34	May 4, 2017	Discussion	- Collecting technical reports and drawings of Kuwil Dam Construction
35	Nov. 21, 2017	Seminar	- Understanding guidelines and regulation on Dam O/M in Indonesia for making Kuwil & Lolak Dam O/M Plan - Introduction on example of Dam O/M rules and practical O/M works in Japan
36	Dec. 18-19, 2018	Discussion	- Discussed on purposes and schedule of Field Seminar on March
37	Jan. 9-11, 2018	Discussion	- Decided schedule, candidate participants for Field Seminar
38	Feb. 12-13, 2018	Discussion	- Re-scheduling for Field Seminar
39	Feb. 26-27, 2018	Discussion	- Re-scheduling again for Field Seminar and choosing participants
40	Apr. 2-6, 2018	Field Activity	- Field Seminar on Real Operation & Maintenance in Indonesia - Visited Jatiluhur Dam (PJT2), Solorojo/Sutami/Sengguruh Dam (PJT1)
41	Apr. 25, 2018	Seminar	- Special Seminar on Dam Operation & Maintenance, support by Japanese short term experts from MLIT
42	Aug. 15, 2018	Seminar	- Seminar on Sediment Management for Dam Reservoir with support by Sub-dit of Dam O/M
Total: 42 times			

Verifiable Indicator 1-3.

Score of RBO benchmarking at the FP sites

Scores of benchmarking at BBWS Ciliwung Cisadane and BWS Sulawesi 1 are mentioned at Table 2.1.14, Table 2.1.15, Table 2.1.27 and Table 2.1.28 at Activity 1-7. The scores at Two (2) FP sites are improved. It is shown at Table 2.2.6.

The Benchmarking score at BBWS Ciliwung Cisadane has improved 22% from 2.60 on year 2015 to **3.17** on year 2018, and at BWS Sulawesi 1 has improved 17% from 2.67 on year 2015 to **3.13** on year 2018. A Level of the achievement is “**High**” at both FP sites

Table 2.2.6 Scores of Benchmarking at BBWS Ciliwung Cisadane and BWS Sulawesi 1

FP site	2015	2016	2017	2018	Improved
BBWS Ciliwung Cisadane	2.60	3.03	3.00	3.17	0.57
BWS Sulawesi 1	2.67	2.77	2.97	3.13	0.46

**Improved: compare between score of 2015 year and 2018 year*

Verifiable Indicator 2-1.

Number of good practices and lessons learned applied to CDF through the project

According to Activity 2-4, JICA Project considered the result of Pre/Post Tests and Questionnaires at Training in 2016 to reflect Training Plan of 2017. As the result, JICA Project conducted three (3) training that topics were come from the result of the Pre/Post Tests and the Questionnaires, 1) Training on Sediment Management for Dam, 2) Water Balance Calculation for Water Allocation Planning, 3) Design of River Facility Structure Therefore, number of good practices and lessons learned applied to CDF through the project is **three (3)**.

JICA Project conducted training mainly from 2016 to 2018 as for the output 2. Training in 2018 is only for benchmarking that was requested by Project Director and Manager and approved at PIU meetings. In 2017, JICA Project conducted three (3) technical focused training out of four (4) training. These topics for three (3) technical training were selected out of questionnaire by the participants from the previous year. Therefore, a level of the achievement is “**High**”.

Verifiable Indicator 2-2.

Number of CD activities jointly implemented in accordance with Annual CD activity plan in PU

JICA Project conducted fourteen (14) training for all BBWS and BWS. The trainings were officially registered as Training of HRDA.

Therefore, Number of CD activities jointly implemented in accordance with Annual CD activity plan in PU is **fourteen (14)**.

Number of training on water resources field conducted by HRDA on 2016 was thirty-eight (38). Share of JICA Project’ training is 22%. The share in 2017 was 10%. JICA Project played a significant role for training implementation during project period. Therefore, a level of the achievement is “**High**”.



Kalender Pengembangan SDM Kementerian PUPR 2017

Struktur Kurikulum Pelatihan
Diklat Teknis Bidang Sumber Daya Air

NO	NAMA PELATIHAN	TANGGAL PELATIHAN	TEMPAT PENYELENGGARAAN	STANDAR KOMPETENSI LULUSAN	MATA DIKLAT	JP	PERSYARATAN PESERTA
SUB BIDANG PELATIHAN JICA							
1	Poor Review of Benchmarking (JICA)	10 - 13 April	Balai Diklat V Yogyakarta				ASN Minimal Golongan III/a Pendidikan Minimal S1 Teknik Sipil atau Lulusan Bidang Teknik/Pengelolaan Alam Pengalaman Minimal 2 Tahun di bidangnya
2	Calculation of Water Balance (JICA)	10 - 13 April	Balai Diklat V Yogyakarta				ASN Minimal Golongan III/a Pendidikan Minimal S1 Teknik Sipil atau Lulusan Bidang Teknik/Pengelolaan Alam Pengalaman Minimal 2 Tahun di bidangnya
3	Sediment Management of DAM (JICA)	15 - 20 Mei	Balai Diklat V Yogyakarta				ASN Minimal Golongan III/a Pendidikan Minimal S1 Teknik Sipil atau Lulusan Bidang Teknik/Pengelolaan Alam Pengalaman Minimal 2 Tahun di bidangnya
4	Design River Facilities	Mei - Juni	Balai Diklat I Medan				ASN Minimal Golongan III/a Pendidikan Minimal S1 Teknik Sipil atau Lulusan Bidang Teknik/Pengelolaan Alam Pengalaman Minimal 2 Tahun di bidangnya

Figure 2.2.1 List of JICA Project Training in 2017 on the Annual Training Plan by HRDA

Table 2.2.7 Number of JICA Project Training which are on the Annual Training Plan by PUPR

No.	Training	Venue	Duration
2016			
1	Dam Operation and Maintenance	Malang City (Balai DIKLAT Surabaya)	4 days, 2 – 5 Feb. 2016
2	Water Allocation	Makassar City (Balai DIKLAT Makassar)	4 days, 23 – 26 Feb. 2016
3	Flood Management	Manado City (Balai DIKLAT Makassar)	4 days, 10 – 13, May 2016
4	River Facility Maintenance	Jakarta (Balai DIKLAT III Jakarta)	4 days, 10 – 12 Aug. 2016
5	Maintenance for Water Resources Infrastructure (WRI)	Bandung (Balai DIKLAT Bandung)	4 days, 30 Aug – 2 Sep. 2016
6	Water Quality Management in Urban Rivers	Jakarta (Balai DIKLAT III Jakarta)	4 days, 27 – 30 Sep. 2016
7	Operation and Maintenance for Irrigation	Surabaya (Balai DIKLAT Surabaya)	4 days, 18 – 21 Oct. 2018
8	River Rehabilitation	Jakarta (Balai DIKLAT III Jakarta)	4 days, 15-18 Nov. 2016
2017			

9	Assessment of BBWS's Performance for Benchmarking	Solo City (Balai DIKLAT Yogyakarta)	5 days, 13 -17 Mar. 2017
10	Sediment Management for Dam	Yogyakarta/Solo City (Balai DIKLAT Yogyakarta)	5 days, 17 - 21 Apr. 2017
11	Calculation of Water Balance for Water Allocation Planning	Semarang City (Balai DIKLAT Yogyakarta)	4 days, 22 - 25 Aug. 2017
12	Design of River Facility Structure	Padang (Balai DIKLAT Medan)	4 days, 12 - 15 Sep. 2017
2018			
13	RBO Performance Benchmarking for BBWS and BWS in West Region	Palembang City (Balai DIKLAT Palembang)	5 days, 9 -13 Apr. 2018
14	RBO Performance Benchmarking for BBWS and BWS in East Region	Mataram City, Lombok, (Balai DIKLAT Surabaya)	5 days, 16 -20 Apr. 2018
14	Total		

Verifiable Indicator 2-3.

R Recommendation to next Mid-term plans of CD in PU

Discussion with HRDA for training planning made both parties realized that some of training by JICA Project has similar topics which were sometimes overlapped with HRDA's own training. However, intended target for participants was different. HRDA's training usually targets for young engineers, technicians, operators or observers. JICA Project training were for mid-Career officials or engineers as decision maker at BBWS and BWS for their works.

Therefore, recommendation for next Mid-term of CD in PUPR is;

- HRDA should consider conducting training for Mid-Career officer / experienced engineers
- Those Training Materials, Curriculum, Syllabus and Pre/Post Test, which are created by the Project should be utilized for future training plan

HRDA understood the situation and Mr. Yudha, head of PUSDIKLAT, mentioned at 4th JCC Meeting on 29th November 2018 that they planned to continue the training program prepared by the Project. Therefore, a level of the achievement is "**High**".

Verifiable Indicator 2-4.

Number of the Project Implementation Unit Meeting held

JICA Project held four (4) JCC Meetings and (4) PIU Meetings. PIU Meeting were usually held once in six (6) months and JCC was for once in a year. There are times when these two meetings were combined into one. The 2nd and 3rd JCC Meeting can be counted as PIU Meeting. Number of the PIU Meeting held is **six (6)**.

After PIU was established by the Ministerial Decree, No.683/KPTS/M/2015, frequency of PIU Meeting held is once in around six (6) months. Therefore, a level of the achievement is "**High**".

Table 2.2.8 Number of the Project Implementation Unit Meeting held

No.	Meeting	Date
1	1 st PIU Meeting	March 15, 2016
2	2 nd JCC Meeting	July 26, 2016
3	2 nd PIU Meeting	December 15, 2016
4	3 rd JCC Meeting	April 12, 2017
5	3 rd PIU Meeting	September 23, 2017
6	4 th PIU Meeting	March 14, 2018
Total: 6 times		

Verifiable Indicator 3-1.**3-1. Number of workshops and seminars conducted**

Regarding workshops and seminar to promote and facilitate more effective and efficient use of CD resources, JICA Project disseminated Modules that Phase 1 Project created to participants at training of Activity 2-2. According to result of Activity 2-2, JICA Project conducted fourteen (14) training. Therefore, Number of workshops and seminars conducted is **fourteen (14)**.

As the result, the Module was disseminated to four hundred fourteen (414) participants of JICA Project training. Level of the achievement is “**High**”.

Verifiable Indicator 3-2.**Number of CD resources revised**

Regarding result of Activity 3-2, ten (10) Modules that Phase 1 Project created are certificated or are in the process of being certificated as official regulation, standard or training material. Table 2.2.9 shows the ten (10) modules. Therefore, Number of CD resources revised is **ten (10)**.

According to PUSAIR which is in charge for technical regulation / standard certification, there are several steps for the inspection for certification of technical regulation / standard. It sometimes takes over one (1) year to certify a new material. Therefore, PUSAIR is able to certify only very limited number of regulation / standards. Considering such a long process, the fact that PUSAIR has revised ten (10) JICA modules as regulation / standard should be considered as “**High**” for the level of achievement.

Table 2.2.9 Number of Modules which were certificated or are in the process of being certificate as official regulation, standard or training material

No.	Field	Module	Current Status
1	River Area Management	Management of Related Organization and Agency	Compiled as Ministerial Regulation 17/PRT/M/2017 on Guidelines for the establishment of TKPSDA at the river basin level
2	Dam Operation	Dam and its complementary structure	Compiled as Ministerial Regulation 27/PRT/M/2015 on Dam
3		Dam Safety Concept	Referred for Revision of SNI (Standard National Indonesia) 03-1731-1989, Guideline for dam safety that have reached the RPT-3 stage (Consensus Meeting)

4		Evaluation on Condition of Seepage at Fill-Type Dam	Referred for SNI 8065:2016 on analysis method and how to control water seepage for fill type dams
5	River Operation & Maintenance	Operation & Maintenance of River	Under compilation as Guideline on Water Resources Operation & Maintenance, Chapter on River by Sub-dit of River & Coast
6		River Morphology Change Control	Under drafting as Guideline
7	Water Quality Management	Construction of OP-IPAL (Waste Water Treatment Plant)	Compiled as SNI 7847:2012 on Waste Water, Specification on Processing Result Part 1: Mud from Pulp and Paper Factories
8	Coastal Management	Observation of Tidal Flow at Coastal Area	Under discussion as Guideline
9		Bathymetry Mapping of Topography at Coastal Area	Compiled as SNI 8283:2016 on Depth measurement method uses echo sounding to produce a bathymetry map Compiled as SNI 7988:2015 on bathymetry survey using multibeam echosounder
10	Geodetic	Horizontal Control Point Network	Compiled as RPT3 - technical specifications of measurement

2.2.2 Project Purpose and indicators

Table 2.2.10 Verifiable Indicators and Means of Verification for Project Purpose

Verifiable Indicators	Means of Verification
1. Number of capacity development activities to RBOs per year. 2. Benchmarking Score	1. Record of training/Periodical report of PIU 2. Benchmarking Report

Verifiable Indicator 1.

Number of capacity development activities to RBOs per year

As a result of Activity 2-2, we had training for all BBWS and BWS from 2016 to 2018. Moreover, JICA Project held a Seminar that cooperated with INACOLD. Table 2.2.11 shows number of training and seminar for all RBO and FP sites.

Total of the number of the participants from FP sites is seventy (70). Especially on 2018, JICA Project conducted the activity for 3.3 times in one month as an average. Therefore, a level of the achievement is “**High**”.

Table 2.2.11 Number of training and Seminar to RBOs per year

Year	For all RBO		For FP sites		Per Year
	Training	Seminar	BBWSCC	BWSSI	
2016	8	-	-	-	8
2017	4	-	-	18	22
2018	2	1	13	24	40

Verifiable Indicator 2.

Benchmarking Score (continuously improved)

JICA Project collected the latest Benchmarking Score List of all BBWS and BWS. Table 2.2.12 show the list

of benchmarking score of all BBWS and BWS.

Four (4) BBWS/BWS have not conducted benchmarking every year. Two (2) BBWS did not improve the score of benchmarking from year 2015. However, twenty-eight (28) BBWS/BWS has improved the score from 2015. An average of improved score is 0.47. therefore, a level of the achievement is “**High**”.

Table 2.2.12 List of Benchmarking Scores of all BBWS and BWS

BBWS, BWS	2015	2016	2017	2018	Improved
BBWS Bengawan Solo	3.23	3.37	3.37	3.37	0.14
BBWS Brantas	3.13	2.97	3.27	3.27	0.14
BBWS Citanduy	3.03	3.17	3.03	3.17	0.14
BBWS Cimanuk Cisanggarung	3.17	3.20	3.17	3.17	0.00
BBWS Cidanau-Ciujung-Cidurian	3.00	3.10	-	-	-
BBWS Pemali Juana	3.03	3.07	3.17	3.20	0.17
BBWS Ciliwung Cisadane	2.60	3.03	3.00	3.17	0.57
BBWS Pompengan Jeneberang	2.57	3.00	3.03	3.20	0.63
BBWS Citarum	2.03	2.80	3.50	3.53	1.50
BBWS Sumatera VIII	2.90	2.83	2.83	2.90	0.00
BBWS Mesuji Sekampung	2.40	2.93	2.93	3.03	0.63
BBWS Serayu Opak	2.47	2.87	2.80	3.03	0.56
BWS Sumatera I	2.27	2.81	2.90	3.03	0.76
BWS Sumatera II	2.23	2.40	2.57	2.93	0.70
BWS Sumatera III	1.60	1.60	-	-	-
BWS Sumatera IV	2.00	2.63	2.53	2.93	0.93
BWS Sumatera V	2.23	2.36	2.60	2.83	0.60
BWS Sumatera VI	2.77	2.80	2.80	2.87	0.10
BWS Sumatera VII	3.00	2.90	2.90	3.13	0.13
BWS Kalimantan I	2.53	2.23	2.63	2.80	0.27
BWS Kalimantan II	2.33	2.67	2.80	2.97	0.64
BWS Kalimantan III	2.70	2.17	2.80	3.00	0.30
BWS Sulawesi I	2.67	2.77	2.97	3.13	0.46
BWS Sulawesi II	2.00	2.23	2.03	2.67	0.67
BWS Sulawesi III	2.60	3.03	2.77	2.80	0.20
BWS Sulawesi IV	2.30	2.23	2.67	2.87	0.57
BWS Bali Penida	2.87	2.60	2.63	3.07	0.20
BWS Nusa Tenggara I	2.97	3.00	3.13	3.27	0.30
BWS Nusa Tenggara II	2.40	2.23	3.00	3.20	0.80
BWS Maluku	2.23	2.00	-	-	-
BWS Maluku Utara	1.60	2.90	2.70	3.00	1.40
BWS Papua	2.23	2.10	2.17	2.37	0.14
BWS Papua Barat	2.17	3.20	2.57	2.63	0.46
BWS Papua Merauke	-	-	-	0.97	-

2.3 History of PDM Modification

<p>Annex I Project Design Matrix (PDM)</p> <p>Project Title: The Project on Capacity Development for River Basin Organizations in Integrated Water Resources Management in the Republic of Indonesia (Phase II)</p> <p>Implementing Agency: Directorate General of Water Resources (DGWR), and Research and Development Agency (RDA), Jakarta (Secretariat of Project Implementation Unit, DGWR, PU), Bandung (PUSAIR), Solo (Balai Sungai and CRBOM), Field practice sites (BBWS Cilivung Cisadane and BWS Sulawesi I)</p> <p>Target Group: Staff members of PIU, DGWR/DWRM, PUSAIR/Balai Sungai, CRBOM, and RBOs of the Field practice sites</p> <p>Indirect Beneficiaries: RBOs under the central government, PUSDIKLAT</p> <p>Duration of the project: 4 years from 2014</p> <p style="text-align: right;">As of: ** April 2014 (Ver. 1.0)</p>					
Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumptions	Achievement	Remarks
Super Goal The Integrated Water Resources Management (IWRM) is implemented effectively, efficiently and sustainably in all river basins of Indonesia.					
Overall Goal The capacity of RBOs on IWRM is continuously enhanced through the developed Capacity Development Framework (CDF).	1. Benchmarking Score (continuously improved) 2. Amount of the budget for the activities	1. Benchmark Report 2. Budgetary Note			
Project Purpose The capacity of RBOs on IWRM is improved through the upgraded mechanism of the capacity development activities for RBOs.	1. Number of capacity development activities (trainings and counselling) to RBOs per year. 2. Benchmarking Score	1. Record of trainings/Periodical report of PIU 2. Benchmarking Report	GOI policy on integrated water resources management continues to attach importance to IWRM and RBOs.		
Outputs 1. Integrated water resources management capacity of RBOs in field practice (FP) sites is improved 2. Capacity Development Framework (CDF) for RBO, including organizational structure, stakeholder's responsibilities and training framework, is developed and operated 3. Accessibility to and reliability of the CD resources, including technical standard, guidelines and manuals for IWRM, are improved	1-1 Participating rate for trainings at the FP sites 1-2 Number of field trainings at the FP sites 1-3 Score of RBO benchmarking at the FP sites 2-1. Number of good practices and lessons learned applied to CDF through the project per year 2-2. Consolidated CDF document 2-3. Annual CD activity plan including the budget in PU 2-4. CD activities plans including the budget developed in RBOs 2-5. Mid- and long-term plans of CD in PU 2-6. Number of the Regular Meeting held 3-1. Number of CD resources prepared, disseminated, and accessed through different means of communication 3-2. Inventory system of the CD resources 3-3. Number of workshops and seminars conducted 3-4. Number of CD training courses conducted 3-5. Number of documents (textbooks, manuals and	1-1. Record of trainings 1-2. Record of trainings 1-3. Benchmarking study 2-1. Questionnaire / Site survey to RBOs., Study on Revised CD materials 2-2. Approved CDF document of PU 2-3. Annual Work Plan of PU 2-4. Annual Work Plan of RBOs 2-5. Approved plans in PU 2-6. Record of Regular Meeting 3-1. Inventory of CD resources and Records of accesses and downloads 3-2. Study on the inventory system 3-3. Periodical report of PIU	The Strategy for Capacity Building on Water Resources Management is stipulated and managed by PU Rules and regulations stipulated by other ministries don't come into conflict with the activities on IWRM.		

guidelines) revised per year		3-4. Training report 3-5. Periodical report of PIU (Project Implementation Unit)		
Activities	Inputs			
<p>1. Integrated water resources management capacity of RBOs in field practice sites is improved</p> <p>1-1. Analyse and break down the expected RBO's functions and roles into daily work activities.</p> <p>1-2. Identify current functions and roles, and the actual daily work activities of several RBOs, and sort out the activities to be strengthened by comparing the actual activities with the ideal functions and roles mentioned above in 1-1.</p> <p>1-3. Identify priority issues, which are necessary to be tackled with stakeholders as common and important targets, in the selected RBOs as pilot fields</p> <p>1-4. Identify concrete work activities to tackle the priority issues recognized in "1-3", and area of the capacity development necessary for these work activities in the selected RBOs.</p> <p>* "Capacity Development (CD)" means Capacity development which aims enhancement of the capacity of RBOs considering the viewpoint of a) capacity of individuals, b) capacity of organization (e.g. Job quality management, decision making, etc), and c) institution and society, as mentioned in the JICA CD handbook.</p> <p>1-5. Make short- and middle- term CD plans to accomplish the capacity development recognized in "1-4" in the selected RBOs.</p> <p>1-6. Carry out the capacity development activities* based on the CD plans and the work activities for the priority issues, in the selected RBOs.</p> <p>1-7. Evaluate regularly the capacity of the RBOs through the progress on implementation of CD plans including the trainings, and the daily work activities to the priority issues, by various methods such as interviews to the staff, existing RBO benchmarking indicators and job assessment.</p> <p>1-8. Consolidate good or bad practices, lessons and challenges learnt through the field practices, based on the output of "1-7".</p> <p>1-9. Improve the each CD plans, considering the output of 1-8, and carry out the revised plans in the selected RBOs.</p> <p>(The activities from "1-3" to "1-9" are called as "Field Practice" in this project.)</p>	The Japanese Side	The Indonesian Side	<Preconditions>	
	<p><Long-Term Expert></p> <ul style="list-style-type: none"> Chief Advisor (Integrated Water Resource Management) Technical Experts (Water Allocation) (Operation and Maintenance) Project Coordinator (Capacity Development) (Structural Management for CD) (Coordination) <p><Short-Term Expert></p> <p>JICA will dispatch short-term experts in the necessary fields for the Project.</p> <p>For example:</p> <ul style="list-style-type: none"> River Management (including Low Water Management) Flood and Drought Management Water Environment (including Water Quality Management, Sedimentation Management) Technical Materials Improvement Irrigation Water Management Financial and Budget Management Stakeholder Coordination Organization Structure Analysis and Enhancement <p><C/P Training in Japan></p> <p>JICA will receive the Indonesian personnel connected with the Project for</p>	<p><Counterpart Staff></p> <ul style="list-style-type: none"> Project Supervisor (Director General for Water Resources, Director General for Spatial Planning, and Director General for Research and Development Agency) Project Director (Director, DWRM as the director for overall responsibility, and Director of 'PUSAIR) Project Manager (Head of Sub-directorate for Water Resources Institution, DWRM, DGWR and Head of Experimental Station for River (Balai Sungai) (for technical resources), PUSAIR, RDA) Project Implementation Unit (PIU) Chairperson: Head, Sub-directorate for Water Resources Institution, DWRM, DGWR) Vice Chairperson: <ul style="list-style-type: none"> a representative of PUSAIR a representative of Education and Training Center, Secretary General a representative of CRBOM <p><Cost for RBO Training/Monitoring and Evaluation></p> <p>The budget necessary for operating the project shall be allocated by the Indonesian side to ensure effective implementation of the Project.</p>	<Issues and countermeasures>	

<p>2. Capacity Development Framework (CDF) for RBO, including organizational structure, stakeholder's responsibilities and training framework, is developed and operated</p> <p>2-1. Review the existing CD mechanisms and activities by the key players (DGWR, PUSAIR, CRBOM, PUSDIKLAT), including the Capacity Development System established by the RBO I project.</p> <p>2-2. Develop formal and practical CDF to supervise CD activities*, clarifying organizational structure, related players' (DGWR, PUSAIR, CRBOM and PUSDIKLAT) responsibilities and training framework for RBO staff on the basis of the related regulations.</p> <p>* CD activity includes (1) CD planning [Plan], (2) implementation of CD plans [Do], (3) CD performance evaluation, RBOs capacity assessment [Check], and (4) improvement of CD plans and training resources such as training material and trainers [Action].</p> <p>2-3. Make and carry out short- and mid-term plans of CD activities for RBOs across the country under CDF, considering the progress of the field practice. (mid-term CD plan includes progressive trainer certification program)</p> <p>2-4. Establish regular coordination committee to supervise the PDCA cycle of CD activities and coordinate the needs of RBOs on CD.</p> <p>2-5. Evaluate the capacity of RBOs periodically and improve the benchmarking mechanism, considering the method of existing benchmarking mechanism for RBOs and the outputs of 1-1 and 1-2.</p> <p>2-6. Supervise the trainings for RBOs based on the CD plan, and support the trainings operated by relevant organizations in coordination with long-term and short-term experts.</p> <p>2-7. Inspect the performance of CD activities for RBOs and reflect its result into the revised CD plans and the CD resources including the technical guidelines/manuals and the training materials.</p> <p>3. Accessibility to and reliability of the CD resources, including technical standard, guidelines and manuals for IWRM, are improved</p> <p>3-1. Make an inventory of the CD resources (e.g. existing guidelines, draft guidelines, manuals, training/ dissemination materials, and trainers).</p> <p>3-2. Implement a PDCA cycle mechanism to improve the reliability of the CD resources, utilizing CDF and the output of the field practices</p> <p>3-3. Improve the existing dissemination mechanism for RBO staff which needs easy accesses to the existing materials and information, in order to ensure effectiveness, efficiency and sustainability of CD activities.</p> <p>3-4. Conduct workshops and seminars to promote and facilitate more frequent, effective and efficient use of CD resources.</p> <p>3-5. Support the relevant organizations in improving reliability of their CD resources</p>	<p>technical training in Japan.</p> <p><Equipment> JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project.</p>	<p><Project Office/Office equipment> Project offices, desks and chairs shall be provided by the Indonesian side</p> <p><Local Cost> • Utilities, Telephone, Fax, etc.</p>	
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Figure 2.3.1 Original PDM

Main revision of PDM at 3rd JCC Meeting on 12 April 2017 are as bellow:

- Activity 2-2: Delete
CD Frameworks was already developed by establishment of HRDA
- Activity 2-4: Revision
PIU is responsible for supervising CD Activity. "regular coordination committee" is changed to "Project Implementation Unit".
- Activity 2-6: Delete
The Project conducts the training with HRDA and other agencies of PU which means the Project automatically supervise the training.
- Activity 3-3: Delete
HRDA had already established Database and sharing (dissemination) system for training participants
- Activity 3-5: Delete
Certification procedure for CD resources to improve reliability is totally internal works in Indonesia

<p>Annex 4 Project Design Matrix (PDM) Project Title: The Project on Capacity Development for River Basin Organizations in Integrated Water Resources Management in the Republic of Indonesia (Phase II) Implementing Agency: Directorate General of Water Resources (DGWR), Human Resource Development Agency (HRDA) and Research and Development Agency (RDA) Project Sites: Jakarta (Secretariat of Project Implementation Unit, DGWR, PU), Bandung (PUSAIR, Solo (Balai Sungai and CRBOM), Field practice sites (BBWS Ciliwung Cisadane and BWS Sulawesi I) Target Group: Staff members of PIU, DGWR/DWRM, PUSAIR/Balai Sungai, CRBOM, and RBOs of the Field practice sites Indirect Beneficiaries: RBOs under the central government, HRDA / PUSDIKLAT Duration of the project: 4 years from January 2015</p>					
As of: 12 April 2017 (Ver. 2.0)					
Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumptions	Achievement	Remarks
Super Goal The Integrated Water Resources Management (IWRM) is implemented effectively, efficiently and sustainably in all river basins of Indonesia.					
Overall Goal The capacity of RBOs on IWRM is continuously enhanced through the existing Capacity Development Framework (CDF).	1. Number of capacity development activities to RBOs per year 2. Benchmarking Score (continuously improved)	1. Record of trainings/Periodical report of PIU 2. Benchmark Report			
Project Purpose The capacity of RBOs on IWRM is improved through the upgraded mechanism of the capacity development activities for RBOs.	1. Number of capacity development activities to RBOs per year 2. Benchmarking Score	1. Record of trainings/Periodical report of PIU 2. Benchmarking Report	GOI policy on integrated water resources management continues to attach importance to IWRM and RBOs.		
Outputs 1. Integrated water resources management capacity of RBOs in field practice (FP) sites is improved 2. Capacity Development Framework (CDF) for RBO, including organizational structure, stakeholder's responsibilities and training framework, is operated 3. Reliability of CD resources (training materials) for IWRM is improved	1-1. Participating rate for trainings at the FP sites 1-2. Number of field trainings at the FP sites 1-3. Score of RBO benchmarking at the FP sites 2-1. Number of good practices and lessons learned applied to CDF through the project 2-2. Number of CD activities jointly implemented in accordance with Annual CD activity plan in PU 2-3. Recommendation to next Mid-term plans of CD in PU 2-4. Number of the Project Implementation Unit Meeting held 3-1. Number of workshops and seminars conducted 3-2. Number of CD resources revised	1-1. Record of trainings 1-2. Record of trainings 1-3. Benchmarking study 2-1. Questionnaire / Site survey to RBOs. Revised CD materials 2-2. Annual Work Plan of PU 2-3. Approved plans in PU 2-4. Record of PIU Meeting 3-1. Minutes of meeting of PIU 3-2. Minutes of meeting of PIU	The Strategy for Capacity Building on Water Resources Management is stipulated and managed by PU Rules and regulations stipulated by other ministries don't come into conflict with the activities on IWRM.		

Activities	Inputs		
1. Integrated water resources management capacity of RBOs in field practice sites is improved 1-1. Analyse and break down the expected RBO's functions and roles into daily work activities. 1-2. Identify current functions and roles, and the actual daily work activities of several RBOs, and sort out the activities to be strengthened by comparing the actual activities with the ideal functions and roles mentioned above in 1-1. 1-3. Identify priority issues, which are necessary to be tackled with stakeholders as common and important targets, in the selected RBOs as pilot fields 1-4. Identify concrete work activities to tackle the priority issues recognized in "1-3", and area of the capacity development necessary for those work activities in the selected RBOs. * "Capacity Development (CD)" means Capacity development which aims enhancement of the capacity of RBOs considering the viewpoint of a) capacity of individuals, b) capacity of organization (e.g. Job quality management, decision making, etc) , and c) institution and society, as mentioned in the JICA CD handbook. 1-5. Make short- and middle- term CD plans to accomplish the capacity development recognized in "1-4" in the selected RBOs. 1-6. Carry out the capacity development activities* based on the CD plans and the work activities for the priority issues, in the selected RBOs. 1-7. Evaluate regularly the capacity of the RBOs through the progress on implementation of CD plans including the trainings, and the daily work activities to the priority issues, by various methods such as interviews to the staff, existing RBO benchmarking indicators and job assessment. 1-8. Consolidate good or bad practices, lessons and challenges learnt through the field practices, based on the output of "1-7". 1-9. Improve the each CD plans, considering the output of 1-8, and carry out the revised plans in the selected RBOs. (The activities from "1-3" to "1-9" are called as "Field Practice" in this project.) 2. Capacity Development Framework (CDF) for RBO, including organizational structure, stakeholder's responsibilities and training framework, is operated 2-1. Review the existing CDF and activities by the key players (DGWR, PUSAIR, CRBOM, PUSDIKLAT). 2-2. Carry out CD activities* along with short- and mid-term plans of for	The Japanese Side <Long-Term Expert> • Chief Advisor (Integrated Water Resource Management) • Technical Experts (Water Allocation) (Operation and Maintenance) • Project Coordinator (Capacity Development) (Structural Management for CD) (Coordination) <Short-Term Expert> JICA will dispatch short-term experts in the necessary fields for the Project. For example: • River Management (including Low Water Management) • Flood and Drought Management • Water Environment (including Water Quality Management, Sedimentation Management) • Technical Materials Improvement • Irrigation Water Management • Financial and Budget Management • Stakeholder Coordination • Organization Structure Analysis and Enhancement <C/P Training in Japan> JICA will receive the Indonesian personnel connected with the Project for technical training in Japan. <Equipment> JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the		The Indonesian Side <Counterpart Staff> • Project Supervisor (Director General for Water Resources, Director General of Human Resources Development Agency (HRDA), and Director General for Research and Development Agency) • Project Director (Director, DWRM as the director for overall responsibility, and Director of PUSAIR, Head, Water Resources and Construction Education and Training Center, HRDA) • Project Manager (Head of Sub-directorate for Water Resources Institution, DWRM, DGWR, Head of Experimental Station for River (Balai Sungai) (for technical resources), PUSAIR, RDA, and Head, Sub-directorate for Hydrology and Water Quality, DWRM, DGWR) • Project Implementation Unit (PIU) Chairperson: Head, Sub-directorate for Water Resources Institution, DWRM, DGWR) Vice Chairperson: - a representative of PUSAIR - a representative of Water Resources and Construction Education and Training Center, HRDA - a representative of CRBOM <Cost for RBO Training/Monitoring and Evaluation> The budget necessary for operating the project shall be allocated by the Indonesian side to ensure effective implementation of the Project.
	<Preconditions> PIU members are formally appointed in PU, before commencement of the project. <Issues and countermeasures>		

<p>RBOs across the country under CDF.</p> <p>* CD activity includes (1) CD planning [Plan], (2) implementation of CD plans [Do], (3) CD performance evaluation, RBOs capacity assessment [Check], and (4) improvement of CD plans and training resources such as training material and trainers [Action].</p> <p>2-3. Establish Project Implementation Unit (PIU) to supervise the PDCA cycle of CD activities and coordinate the needs of RBOs on CD.</p> <p>2-4. Evaluate the capacity of RBOs periodically and improve the benchmarking mechanism, considering the method of existing benchmarking mechanism for RBOs and the outputs of 1-1 and 1-2, if necessary.</p> <p>2-5. Inspect the performance of CD activities for RBOs and reflect its result into the revised CD plans and the CD resources including the training materials and trainers.</p> <p>3. Reliability of the CD resources (training materials) for IWRM is improved</p> <p>3-1. Make an inventory of the CD resources (e.g. training/ dissemination materials, and trainers).</p> <p>3-2. Implement a PDCA cycle mechanism to improve the reliability of the CD resources, utilizing CDF and the output of the CD activities.</p> <p>3-3. Conduct workshops and seminars to promote and facilitate more effective and efficient use of CD resources.</p>	<p>Equipment") necessary for the implementation of the Project.</p>	<p><Project Office/Office equipment> Project offices, desks and chairs shall be provided by the Indonesian side</p> <p><Local Cost> • Utilities, Telephone, Fax, etc.</p>	
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Figure 2.3.2 Modified PDM

2.4 Other

2.4.1 Results of Environmental and Social Considerations (if applicable)

N/A

2.4.2 Results of Considerations on Gender/Peace Building/Poverty Reduction (if applicable)

N/A

CHAPTER 3 RESULTS OF JOINT REVIEW

3.1 Results of Review based on DAC Evaluation Criteria

3.1.1 Relevance

The relevance of the Project is very high for the following reasons.

Given the fact the whole government of Indonesia highly think of the importance of capacity development of public servant, the recipient Ministry also sees the needs to improve its capability of the staff. By the establishment of Human Resource Development Agency, the Ministry has streamlined its training program to the staff. The Project has worked together with HRDA from the start of Project in 2015 to ensure the curriculum the Project offers were in line with the needs of the Ministry. These also served as good capacity building training for the staff of HRDA.

The main task of River Basin Organization (RBO) has been changed from the construction of water related facilities including dams and weirs to management of water resources such as coordination of stakeholders. The Project covers a wide range of training in the water management. The aims of the Project are well matched in such needs of the Ministry.

In addition to these above, there had been long period of time when the Ministry did not hire adequate amount of engineers due to various reasons. The number of experienced engineers who can manage water resources are very limited. Therefore, there was strong needs from the Ministry side to provide training that aims to gain the knowledge for the mid-career engineers. By differentiating the targeted participants for the training from those training conducted by HRDA, the training provided by the Project were much appreciated.

3.1.2 Effectiveness

Effectiveness of the Project is very high for the following reasons.

The Project purpose is “The capacity of RBOs on IWRM is improved through the upgraded mechanism of the capacity development activities for RBOs”. The Project provide fourteen (14) training targeted for all RBOs and four hundred and fourteen (414) were participated. Considering that training conducted by HRDA are for the young engineers and not all of them are in the field of water resources, these training have very significant meanings for the recipient Ministry.

It is also worth mentioned that almost all the RBO has improved the Benchmarking Score since the Project started in 2015. It is fair to state that capacity development needs time and often is hard to see the impact. Benchmarking Score is one of the Indicators to check the impact of the Project. Comparing scores from 2015 to 2018, most RBOs have better benchmarking score.

The Project also provide “Homemade” training program for the staff of two pilot sites, BBWS Ciliwung Cisadane and BWS Sulawesi I. Since both RBOs have different size and location, the role of each office differs from one another. The Project supported to analyze the problem faced by them and decide what needs to be learned by the staff so that they could use the knowledge for the daily work. The Project successfully

conducts number of training for them.

The Project also recommended and used not only Japanese expert but also Indonesian expert who used to work for research facility of the Ministry such as Center of River Basin Organization and Management, “CRBOM” and Research Center for Water Resources, “PUSAIR” to improve the effectiveness of Project.

3.1.3 Efficiency

The efficiency of the Project is of the Project is very high for the following reasons.

The Project input three (3) Japanese long term who stayed an entire duration of the Project and seven (7) short time experts with the cost of approximately IDR 6 billion to manage the Project. It also included two kinds of training, one is domestic and other is international. A total of fifteen (15) training was provided for the participants from all RBOs since February in 2016 with variety of topics to cover various needs for managing RBOs.

There are also training / field survey and seminar for selected pilot site RBO, Ciliwung Cisadane and Sulawesi I. Topic of the activities are carefully selected by analyzing official document of the Ministry and coordinate with the RBO to match with their need. Those activities are conducted thirteen (13) times for RBO Ciliwung Cisadane and twenty six (26) for RBO Sulawesi I.

The Project also sent thirty three (33) Indonesian staff to Japan to observe and learn how the way Japanese Ministry is handling water related issues. The training in Japan was specially designed for PU staff to meet their expectation and need.

All of these activities above are well planned and carefully managed with relatively low cost. These would not be able to happen if there were no Project. Therefore, the both parties believe the efficiency of the Project is considered as high.

3.1.4 Impact

The impact of the Project is very high for the following reasons.

The way the Project support to analyze what needs to be done for a proper management for water resources in selected pilot Project site helps to achieve overall goals in a long run. Though the both parties think it needs more time to see the impact clearly, it would be possible to achieve if these RBO continue working towards it. It is also important to mention that there was no budgetary constraint for the human resource development activity for these RBOs.

The Project activity also helped to streamlined the procedure to implement the training. It was somewhat hard to implement smoothly at the beginning of the Project since newly established HRDA was also trying to streamline the procedure. However, as time goes by, it became much smoother to handle the training. The Project also could see positive impact in the way regional training center handles the training. It seems that they are now more confident on how they commit to the training as one of implementer. Therefore, the Project gave positive impact for the human resource development activity.

3.1.5 Sustainability

Sustainability of the activity is high.

The Ministry realizes the importance of human resource development for the staff. The possibility of continuation of the activity is very high after the Project completes. The Ministry established HRDA to concentrate for providing high quality training which formerly done by different parts of the Ministry. Due to the establishment, there are sufficient fund for the training and the agency has clear aim for the number of training for each sector of the Ministry. Therefore, sustainability of the activity is very high.

3.2 Key Factors Affecting Implementation and Outcomes

It is fair to mention that the biggest contribution to the outcome of the Project is the establishment of HRDA. The agency has a mechanism to research the topic of the training, plan annually and allocate money to each training center in Indonesia.

The agency also helps to build a chain of command so that there is less communication gap between the central and regional office. Now the each office can see easily what sort of training would be provided each year to have a clear plan for their staff for capacity development.

The Project support HRDA in implementing practical training for mid-career staff to brush up their knowledge and to give new technology.

The Project also provide overseas training with budgetary support.

3.3 Evaluation on the results of the Project Risk Management

Coordination with Field Practice Sites and BBWS/BWS for Capacity Development Activities in all over Indonesia together with its main implementer, HRDA, has been smooth since main counterpart is Directorate General of Water Resources (DGWR).

On the other hand, the Project did not contribute much to actively involved with Balai Sungai and CRBOM as Phase 1 project did.

Regarding FP Sites, access to both FP sites is adequate. Therefore, JICA Project Team could visit them frequently. However, chief adviser of JICA Project is absent from beginning of 2nd year. If there are two (2) Japanese technical experts as original plan, there would be a better possibility that JICA Project could conduct capacity development activity more frequently and efficiently, especially with BBWS Ciliwung Cisadane.

3.4 Lessons Learned

Government of Indonesia has a clear vision of the importance of staffing. In line with it, the Ministry of Public Works and Housing also sets its target to train their staff to improve their capacity. Therefore, it should not be much problem for the ministry to keep activities for such training.

However, it is unavoidable for the rotation of the personnel since the ministry is in the public sector. What the both party concern now is to build a system where those who learned from the training would pass the

knowledge to someone new so that the knowledge will stay within the RBO / office even after these people rotates to other part of the ministry. Otherwise, there will always the shortage / missing of the knowledge.

When HRDA was established in 2015, there was a clear cut line that all the training would be handled by HRDA. For other PU agencies like CRBOM and PUSAIR handed over a part of their function as “training center”. Now these two organizations only provide “workshop” and “seminar”, but it seems not many are happening. Since they have plenty of knowledge and experience in the field, it would be “win-win” solution if they are used properly. The ministry should utilize them as much as possible. Otherwise, it is waste of good resources.

Other thing the Project learned was the importance of feedback from the participants. Pre / post test were collected before and after the training, the Project carefully analyze it and used for suggestion for the training in following year. This feedback system was very helpful to create more effective training.

Lastly, finding adequate lecturer was one of the most important factors for a better training. The Project also faced a problem of having good instructor since most of them were present staff / directors of the ministry who also have to handle their daily work. For them, it was not so easy to seek extra time to prepare and deliver lecture since most of them are already ready when they were asked to be lecturer. After a series of discussion, the Project team decided to use retired personnel who have enough knowledge and experience yet they were not as busy as current staff of the ministry.

CHAPTER 4 FOR THE ACHIEVEMENT OF OVERALL GOALS AFTER THE PROJECT COMPLETION

4.1 Prospects to achieve Overall Goal

As it was stated above, overall goal of the Project, “The capacity of RBOs on IWRM is continuously enhanced through the existing Capacity Development Framework (CDF)” can be possible to achieve, but it needs more time as capacity development takes long time. Full time commitment is required and the ministry think much of it, therefore, it is achievable in the near future.

4.2 Plan of Operation and Implementation Structure of the Indonesia side to achieve Overall Goal

The hardest part from the Indonesian Government side, which is to create its own agency that is dedicated only for the improvement of capacity of the staff, has already completed. Various kinds of training are implemented each year with clear aim and topic. Budget allocation has been sufficient. It might need to build more courses for mid to senior staff in the minister since many of the courses are set target for young engineer. Therefore, it might take some more time but the ministry eventually achieves overall goal.

4.3 Recommendations for the Indonesia side

➤ Capacity Development Framework in HRDA

PUPR has established HRDA as responsible agency for Human Resources Development. Functions and mechanism of HDRA’s activity, especially conducting training, are functioned smoothly and effectively. However, JICA project would like to recommend conducting training that target participants are mid-Career officials and engineers, so that HRDA’s Training framework can cover wide level and class of officials and engineers of PUPR.

Regarding topics and issues for capacity development on water resources management, JICA Project would like to raise several topics.

➤ Capacity Development for Dam Operation & Maintenance Planning

Through the Activity 1-6 at BWS Sulawesi 1, JICA Project could understand a situation of preparation for new dam.

Indonesia Government and PUPR are progressing new dam construction projects, sixty-five (65) dams started or completed construction works from 2015 to 2019. It means around 65 dams will have to start operation in near future. It is essential for new dams to prepare the operation & maintenance plan to optimize dam from beginning of operation stage.

However, only several dam of around two hundred (200) existing dams in Indonesia now have certificated Operation & Maintenance Rules with a license. For achievement of overall goal after JICA Project, PUPR should conduct more training at classroom and field on Dam Operation & Maintenance planning and implementing for middle class officials or engineers at BBWS and BWS as leader of Dam Operation & Maintenance unit.

➤ **Improvement of Dam Operation & Maintenance, especially for emergency response for Flood and Earthquake**

Regarding emergency response for Flood, water level data at station should be able to convert flow rate (debit) into unit of m^3/s . Because discharge from dam is usually calculated and managed by volume as unit of m^3/s . If a water level station at upstream has a H-Q curve that can convert from water level (m) to flow rate (m^3/s) until high water range, dam operator can forecast volume of inflow to reservoir for flood control operation planning. If the station at downstream has the H-Q curve, water level at downstream can be forecasted with adequate accuracy with consideration of discharge volume from dam.

Most of the water level stations has H-Q curve, but it can be applied for low water range only. Therefore, JICA Project would like to recommend conducting capacity development activity for high water flow measurement to create H-Q curve at high water range. The activity can refer JICA Project's Activity 1-6 at BWS Sulawesi 1 on high water flow measurement by float method.

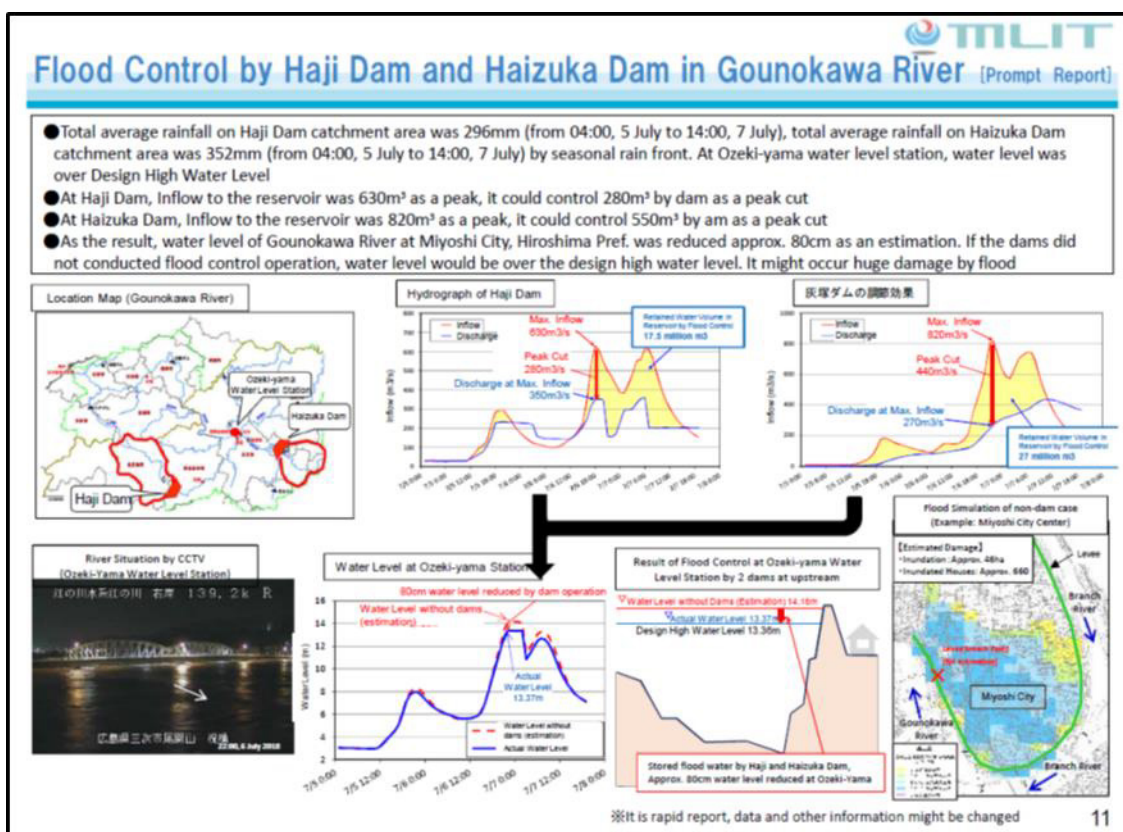


Figure 4.3.1 Example of effectiveness of flood control by dams with water level estimation by H-Q Curve at Downstream of Dam in Japan

* Source: Presentation Material of Mr. HISHIDA at INACOLD Seminar at Batam, Oct. 2018

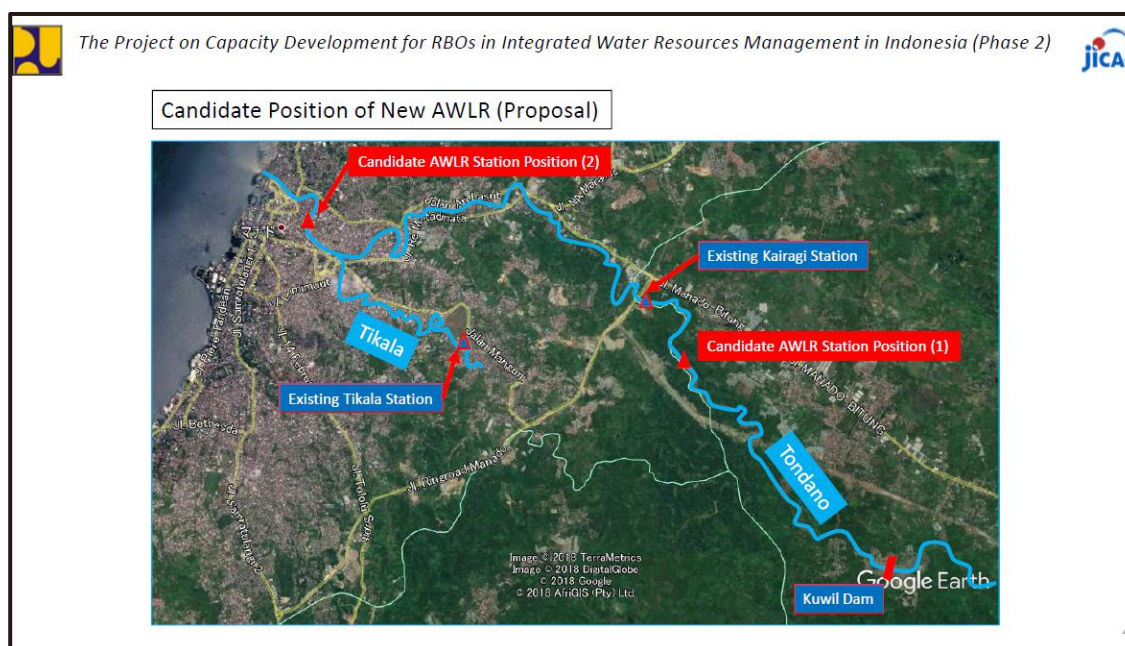


Figure 4.3.2 Recommendation on new AWLR locations for adequate Dam Operation at BWS Sulawesi 1

Regarding **emergency response for earthquake**, it becomes one of the important issues for dam safety and maintenance. In this year 2018, Indonesia had two (2) big earthquake, on 29th July 2018 in Lombok, on 28th September 2018 in Central Sulawesi island. Fortunately, there was no serious damage of dams. But there were small scale damages at several dams in Lombok island.

On the other hand, JICA Project conducted OJT on “Operation & Maintenance of Dam (Situ) for safety” with BBWS Ciliwung Cisadane.

Guideline or manual for emergency response against earthquake at dams are available in Indonesia. However, current situation that big earthquake occurs frequently is good opportunity to review and train implementing appropriate emergency check and quick reporting on check result on earthquake from dam operator to PUPR and Dam Safety Commission. MLIT and JWA have a lot of experiences for emergency response against earthquakes. These experiences and examples of MLIT and JWA can be referred for capacity development on dam safety against earthquakes.

Regarding on flood and earthquake for dam, periodical maintenance works is also indispensable to keep adequate condition of facility to optimize functions of dam. Dams in Japan, managed by MLIT and JWA, have implemented periodical maintenance, such as daily, weekly, monthly, half year, annual, Periodical Inspection (once in 3-5 years), Comprehensive Inspection (once in 30 years). These experiences and examples including manual and check list format can be contributed.

4.4 Monitoring Plan from the end of the Project to Ex-post Evaluation

The ministry needs some more time to concrete the system of capacity development since the system in place is still new. It might need another three (3) to five (5) years for the Ex-post Evaluation.

