ADB

Completion Report

Project Numbers: 37049-013 and 37049-023
MFF number: 0027
Loan Numbers: 2500 and 2501
Grant number: 0216
TA number: 7189
September 2018

Indonesia: Integrated Citarum Water Resources Management Investment Program

Asian Development Bank

CURRENCY EQUIVALENTS

Currency Unit – Indonesian rupiah (Rp)

		At Appraisal	At Project Completion
		19 June 2008	31 May 2016
Rp1.00	=	$0.0001	$0.000075
$1.00	=	Rp9,300	Rp13,273

ABBREVIATIONS

ADB	–	Asian Development Bank
BAPPENAS	–	*Badan Perencanaan Pembangunan Nasional* (national development planning agency)
BBWSC	–	*Balai Besar Wilayah Sungai Citarum*
BWS		bulk water supply
CRB	–	Citarum River Basin
CSP	–	country strategy and program
CVM	–	conservation village model
DED	–	detailed engineering design
DMF	–	design and monitoring framework
DGWR	–	Directorate General of Water Resources
FFA	–	Framework Financing Agreement
ICWRMIP	–	Integrated Citarum Water Resources Management Investment Program
IRM	–	Indonesia Resident Mission
IWRM	–	Integrated Water Resources Management
MFF	–	multitranche financing facility
MOA	–	Ministry of Agriculture
MOE	–	Ministry of Environment
MOEFr	–	Ministry of Environment and Forestry
MOH	–	Ministry of Health
MPWH	–	Ministry of Public Works and Housing
NGO	–	nongovernment organization
O&M	–	operation and maintenance
OSPF	–	Office of the Special Project Facilitator
PAM	–	program administration memorandum
PES	–	payment for ecosystem services
PFR	–	periodic financing request
PIU	–	project implementation unit
PJT II	–	*Perum Jasa Tirta* II (PJT II)—a state owned company that operates the WTC
PMU	–	program management unit
PPTA	–	project preparatory technical assistance
RCMU	–	roadmap coordination management unit
RP	–	resettlement plan
ROW	–	right-of-way
SRI	–	System Rice Intensification
TA	–	technical assistance
WTC	–	West Tarum Canal

WEIGHTS AND MEASURES

km	–	kilometer
km^2	–	square kilometer
ha	–	hectare = 10,000 square meters
m^3	–	cubic meter
m^3/s	–	cubic meter per second
mg	–	milligram

GLOSSARY

Integrated Water Resources Management (IWRM)	–	Process to promote coordinated development and management of water, land, and related resources in river basins, to maximize equitable socioeconomic benefits without compromising the sustainability of vital ecosystems. Focuses on delivering a triple bottom line of economic, social, and environmental benefits resulting from an integrated approach.
River Basin Organization (RBO)	–	General term referring to any government organization with a mandate in water resources development and/or management with responsibilities covering a single river or group of rivers.
Balai Besar (Balai Besar Wilayah Sungai Citarum— BBWSC*) (*Citarum river basin organization*)*	–	Central government organization with a broad mandate that includes aspects of water resource planning, development, and management, operating within a defined river basin territorial area covering either a single large river catchment or group of smaller river catchments. BBWSC operates in the Citarum River Basin territory.
6 Ci's river basin territory	–	River basin territory comprising three river basin organizations—*Balai Besar Citarum*, *Balai Besar Ciliwung–Cisadane*, and *Balai Besar Cidanau–Ciujung–Cidurian*— located in West Java, DKI–Jakarta, and Banten provinces, and the metropolitan conurbation of Jabodetabek (see below).
Perum Jasa Tirta (PJT II) (public corporation of water services)	–	State-owned corporation with a water infrastructure management mandate, operating in the Citarum River Basin.
District or local government	–	Third tier of government below, although independent from, provincial and national governments.
Regional government	–	General term referring to provincial and/or district governments.
Jabodetabek	–	Greater Jakarta metropolitan area (Jakarta, Bogor, Depok, Tangerang, Bekasi) and surrounding area.
Pola	–	Water resource management strategic plan that is the framework for planning, implementation, and monitoring and evaluation for water resources conservation, utilization, and control.

Rencana	–	Comprehensive and integrated water resources management plan required for the implementation of water resources management.
Tugas Pembantuan (co-administered task)		An assignment from: (i) the central government to a region and/or district; and (ii) the provincial government to a district/city, with the obligation to report on the implementation of the assignment to the central government or the provincial government.

NOTES

(i) The fiscal year (FY) of the government of Indonesia ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2009 ends on 31 December 2009.

(ii) In this report, "$" refers to United States dollars.

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BASIC DATA

A. Facility and Loan Identification

1.	Country	Republic of Indonesia
2.	Facility number	0027
	Loan number and financing source	2500 (Ordinary Capital Resources (OCR)); 2501 (Concessional Ordinary Capital Resources (COL))
	Grant number and financing source	0216 (Global Environment Facility)
3.	Project title	Integrated Citarum Water Resources Management Investment Program
	Grant title	Citarum Watershed Management and Biodiversity Conservation
4.	Borrower and Grant Recipient	Republic of Indonesia
5.	Executing agency	Ministry of Public Works and Housing (Loan) Ministry of Environment and Forestry (Grant)
6.	Amount of facility	$503.80 million
	Amount of loan	$20,000,000 (OCR) + SDR20,162,000 (COL) equivalent to $30,000,000
	Amount of grant	$3,750,000
7.	Project completion report number	PCR: INO 1712
8.	Financing modality	Multitranche financing facility (MFF)

B. Facility and Loan Data

1.	Appraisal	
	– Date started	25 August 2008
	– Date completed	30 August 2008
2.	Loan negotiations	
	– Date started	29 October 2008
	– Date completed	29 October 2008
3.	Date of Board approval	4 December 2008 (MFF) 22 December 2008 (Loans) 4 August 2010 (Grant)
4.	Date of loan agreement	22 April 2009
	Date of grant agreement	4 October 2010
	Date of framework financing agreement	29 October 2008
5.	Date of loan and grant effectiveness	
	– In loan agreement	3 June 2009
	In grant agreement	12 November 2010
	– Actual	3 June 2009 (loan) and 12 November 2010 (grant)
	– Number of extensions	0
6.	Project completion date	
	– Appraisal	31 December 2023 (MFF) 31 December 2013 (Loans and Grant)
	– Actual	31 May 2016

7.	Loan closing date	
	– In loan agreement	30 June 2014
	– Actual	31 May 2016
	– Number of extensions	Three: one for loans and two for grant
8.	Financial closing date	
	– Actual	30 May 2017 (Grant) 7 September 2017 (Loan)
9.	Terms of loan	
	– Interest rate	LIBOR and 0.60% less credit of 0.40% (OCR) 1% per annum during the grace period, and one and 1.5% per annum thereafter (COL)
	– Maturity (number of years)	25 years (OCR); 32 years (COL)
	– Grace period (number of years)	5 years (OCR); 8 years (COL)
10.	Terms of relending (if any)	none
	– Interest rate	
	– Maturity (number of years)	
	– Grace period (number of years)	
	– Second-step borrower	

11. Disbursements

a. Dates

Initial Disbursement	Final Disbursement	Time Interval
16 November 2010 (L2500)	19 July 2016	68
16 November 2010 (L2501)	28 February 2017	75
6 May 2011 (G0216)	9 May2017	72
Effective Date	**Actual Closing Date**	**Time Interval**
3 June 2009 (loans)	31 May 2016	84
12 November 2010 (grant)	31 May 2016	66

b. Amount ($ million)

Category	Original Allocation (1)	Increased during Implementation (2)[1]	Cancelled during Implementation (3)	Last Revised Allocation (4=1+2–3)	Amount Disbursed (5)	Undisbursed Balance (6 = 4–5)
Loan 2500						
1 Works (WTC)	20.000	-4.818	1.450	13.732	13.693	0.039
1A Add Works & Escalation (WTC)	0	4.818	1.250	3.568	3.539	0.029
Subtotal 2500	**20.000**	**0**	**2.700**	**17.300**	**17.232**	**0.068**

[1] Based on the loan agreement amendment, dated 18 June 2014, and the grant extension and reallocation, dated 24 February 2015.

Loan 2501						
1 Works						
1A WTC	11.890	-4.238	0	7.652	7.551	0.101
1B Other works	3.720	-1.283	0	2.437	2.422	0.015
2 Equipment	0.700	-0.110	0	0.590	0.574	0.016
3 Training	2.220	-0.367	0	1.853	1.835	0.018
4 Consulting Services	11.470	5.652	0	17.122	12.202	4.920
Subtotal 2501	**30.000**	**-0.346**	**0**	**29.654**	**24.584**	**5.070**
Grant 0216						
1. Consulting service	2.389	-0.254	0	2.135	2.010	0.125
2. Vehicle and equipment	0.588	-0.138	0	0.450	0.443	0.007
3. Project management and coordination	0.175	0.230	0	0.405	0.325	0.080
4. Survey and investigation	0.041	-0.006	0	0.035	0.027	0.008
5. Training and demonstration	0.063	0.117	0	0.180	0.177	0.003
6. Socialization and community development	0.494	0.051	0	0.545	0.634	-0.089
Subtotal G0216	**3.750**	**0**	**0**	**3.750**	**3.616**	**0.134**
Total	**53.750**	**-0.346**	**2.700**	**50.704**	**45.432**	**5.272**

b. Amount (SDR million)

Category	Original Allocation (1)	Increased during Implementation (2)	Cancelled during Implementation (3)	Last Revised Allocation (4=1+2–3)	Amount Disbursed (5)	Undisbursed Balance (6 = 4–5)
Loan 2501						
1 Works						
1A WTC	7.991	-2.664	0	5.327	5.254	0.073
1B Other works	2.500	-0.930	0	1.570	1.559	0.011
2 Equipment	0.470	-0.091	0	0.379	0.367	0.012
3 Training	1.492	-0.314	0	1.178	1.172	0.013
4 Consulting Services	7.709	3.998	0	11.707	8.151	3.550
Subtotal 2501	**20.162**	**0**	**0**	**20.162**	**16.503**	**3.659**

12. Local costs (financed)

– Amount ($)	Not Applicable (N/A)
– Percent of local costs	N/A
– Percent of total costs	N/A

C. Project Data

1. Project cost ($ million)

Cost	Appraisal Estimate	Actual
Foreign exchange cost	28.40	17.54
Local currency cost	75.00	46.31
Total	**103.40**	**63.85**

2. Financing Plan ($ million)

Facility

Source	Appraisal					Actual
	P1	P2	P3	P4	Total	P1
ADB ADF Loan	30.0	0.0	0.0	0.0	30.0	17.2
ADB OCR Loan	20.0	266.3	130.0	53.6	470.0	24.6
Central Government[a]	34.3	123.9	60.2	163.1	381.6	7.3
ADB (TA)	1.0	1.0	1.0	1.0	4.0	0.9
Parallel Funding (TA)[b]	4.0	0.0	0.0	0.0	4.0	0.0
Government of the Netherlands (TA)	5.0	0.0	0.0	0.0	5.0	5.7
Multi-Donor Trust Fund WFPF (TA)[c]	2.0	0.0	0.0	0.0	2.0	2.0
Beneficiaries	3.3	4.0	5.9	8.0	21.0	0.3
Global Environment Facility	3.8	0.0	0	0.0	3.8	3.6
Climate Change Fund	0.0	-	-	-	-	2.2
Total	**103.4**	**395.2**	**197.1**	**225.7**	**921.4**	**63.8**

ADB = Asian Development Bank, ADF = Asian Development Fund, OCR = ordinary capital resources, P = project, TA = technical assistance, WFPF = Multi-Donor Trust Fund under the Water Financing Partnership Facility.
[a] $2.7 million of the $34.4 million is a contribution to TA funding.
[b] Proposed financing support of Korea Water Resources Corporation.
[c] Contributors: the governments of Australia, Austria, Norway, Spain, and Switzerland.
Sources: Government of Indonesia and ADB estimates.

PFR 1

Cost	Appraisal Estimate	Actual
Implementation cost		
Borrower financed	31.65	6.61
ADB financed	50.00	41.81
Other external financing:		
- TA	8.00	10.84
- Beneficiaries	3.14	-
- Parallel funding[a]	4.05	-
- GEF Grant	3.80	3.61
Total implementation cost	**100.64**	**62.87**
Interest during construction costs		
Borrower financed	2.75	0.96
ADB financed	-	-
Other external financing	-	-
Total interest during construction cost	**2.75**	**1.00**
Total	**103.39**	**63.83**

ADB = Asian Development Bank, IDC = interest during construction, TA= Technical Assistance, GEF=Global Environment Facility
[a] Parallel funding from Korea Water Resources Corporation.

3. Cost breakdown by project component ($ million)

Component	Appraisal Estimate	Actual
A. Based Cost[a]		
1. Institutions and Planning for IWRM	10.3	4.1
2. Water Resources Development and Management	456.2	36.1
3. Water Allocation and Sharing	6.0	2.0
4. Environmental Protection	84.8	4.4
5. Disaster Management	60.7	3.0
6. Community Empowerment	2.2	7.5
7. Data, Information, and Decision Support	6.8	1.7
8. Program Management	18.2	4.0
Subtotal (A)	**645.2**	**62.8**
B. Contigencies[b]		
1. Physical	56.0	0
2. Price	165.6	0
Subtotal (B)	**221.6**	**0**
C. Financial Charges During Implementation[c]		
1. Interest During Implementation	50.8	0.8
2. Commitment Charges	3.8	0.2
Subtotal (C)	**54.6**	**1.0**
Total (A+B+C)	**921.4**	**63.8**

IWRM = integrated water resources management.

[a] Mid-2008 prices, including taxes and duties of $84 million.

[b] Physical contingencies range from 5% to 10% for civil works and are set at 5% for field research and development, training, surveys, and studies. Price contingencies are computed at 0.5% to 1.5% for foreign exchange costs and 5.6% to 6.8% for local currency costs and include provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

[c] Includes interest, commitment charges, and front-end fees. Interest during construction has been computed at the 5-year forward London interbank offered rate plus a spread of 0.2%.

Sources: Government of Indonesia and Asian Development Bank estimates

PFR 1

Subcomponent	Appraisal Estimate	Actual[2]
1.1 Road map Management	3.35	2.10
2.1 Rehabilitation of WTC	50.24	33.50
2.2 Improved Land and Water Management	7.14	3.43
2.3 Support for Community- and NGO-driven Initiatives	6.00	4.04
2.6 DED for Upgrading Bandung Bulk Water Services	4.75	-
4.1 Development and Implementation of River Basin Quality Improvement Strategy	5.21	1.09
4.2 Watershed Management and Biodiversity (Grant)	4.77	3.91
8.1 Program Management	2.88	2.61
8.2 Independent Monitoring and Evaluation	1.55	1.35
TA 7189-INO	10.70	10.84
Parallel Funding[a]	4.08	-
Financial Charges During Implementation	2.75	0.96
Total	**103.42**	**63.83**

[a] Parallel funding from Korea Water Resources Corporation.

DED = detailed engineering design, INO = Republic of Indonesia, NGO = nongovernment organization, WTC = West Tarum Canal.

[2] Based on actual disbursements as of May 2017.

4. Project schedule

Item	Appraisal Estimate	Actual
Date of contract with consultants		
(i) Road Map Management (BAPPENAS)	Q4 2009	30 September 2010
(ii) Improved Land and Water Management (MOA)	Q4 2009	Cancelled
(iii) Support for Community and CSO-driven Initiatives for Improved Water Supply and Sanitation (MOH)	Q4 2009	1 December 2010
(iv) Basin River Quality Improvement Strategy and Action Plans (MOE)	Q2 2010	27 August 2014
(v) Watershed Management and Conservation (GEF Grant- MOFr)	Q3 2010	14 December 2012
(vi) Program Management (MOPW)	Q4 2009	25 June 2010
(vii) Independent Monitoring and Evaluation (BAPPENAS)	Q2 2010	28 November 2011
(viii) West Tarum Canal Detailed Engineering Design and Supervision (MOPW)	Q4 2009	12 August 2010
Completion of engineering designs (West Tarum Canal Rehabilitation)	2010	2012
Civil works contract		
(i) Construction of Bekasi Syphon		
Date of award	Q1 2009	24 June 2010
Completion of work	Q4 2012	31 December 2015
(ii) Rehabilitation of West Tarum Canal (Package 1 contract)		
Date of award	Q3 2010	1 November 2013
Completion of work	Q4 2013	30 April 2016
(iii) Rehabilitation of West Tarum Canal (Package 2 contract)		
Date of award	Q3 2010	6 February 2013
Completion of work	Q4 2013	31 December 2015
Equipment and supplies	-	-
Dates	-	-
First procurement	-	-
Last procurement	-	-
Completion of equipment installation	-	-
Start of operations		
Completion of tests and commissioning	Q2 2014	May 2016
Beginning of start-up	-	May 2016
Other milestones	-	-

5. Project performance report ratings

Implementation Period	Ratings: Development Objectives	Ratings: Implementation Progress
From 1 July 2009 to 31 December 2009	Satisfactory	Satisfactory
From 1 January 2010 to 31 December 2010	Satisfactory	Satisfactory
	Single Project Rating	
From 1 January 2011 to 31 December 2011	On track	
From 1 January 2012 to 30 September 2012	On track	
From 1 October 2012 to 31 December 2012	Potential problem	
From 1 January 2013 to 31 December 2013	Actual problem	
From 1 January 2014 to 30 September 014	Potential problem	
From 1 October 2014 to 31 December 2014	On track	
From 1 January 2015 to 31 December 2015	On track	
From 1 January 2016 to 31 May 2016	On track	

D. Data on Asian Development Bank Missions

Name of Mission[a]	Date	No. of Persons	No. of Person-Days	Specialization of Members[b]
Appraisal	25-30 August 2008	10	50	a, b, c, d, f, g
Inception	11-27 February 2009	4	40	a, f, g
Special Project Administration	6-16 April 2010	9	20	a, f, g
Review 1	21 September-26 October 2010	6	30	a, e, f, g
Review 2	27 April-27 June 2011[c]	8	40	a, e, f, g
Review 3	17 January-2 April 2012[c]	9	45	a, e, f, g
Midterm Review (Review 4)	18 June-18 October 2012[c]	12	60	a, e, f, g
Review 5	13 May-22 July 2013[c]	5	25	a, e, f, g
Review 6	10 January-3 February 2014[c]	5	25	a, b, f, g
Review 7	9 September-28 November 2014[c]	4	20	f, g
Review 8	18 August-4 September 2014[c]	5	10	f, g
Project completion review	24 May-29July 2016[c]	2	10	b, f, g

[a] Include identification, fact-finding, pre-appraisal, appraisal, project or program inception, review, special loan administration, disbursement, project or program review mission. If more than one of each type of mission, number consecutively as review mission 1, 2, etc.

[b] May use reference letters in table, e.g., a = water resources specialist, b = financial analyst, c = counsel, d = economist, e = procurement consultant or specialist, f = safeguard officer, g = project officer.

[c] Intermittent

I. PROJECT DESCRIPTION

1. The Citarum River Basin (CRB) is in the province of West Java and covers 13,000 square kilometers (km^2). The government of Indonesia considers it the most strategic river basin territory in the country because it provides 80% of the surface water supply to the capital city of Jakarta.[1] In 2008 the CRB supported a population of more than 28 million people and 20% of the country's industrial output. The upper basin has three hydroelectric dams producing a total of 1,400 megawatts. The river feeds irrigation covering close to 400,000 hectares (ha) that produce 5% of the country's rice. Over the past two decades the basin's water resources have come under increased pressure from urbanization and industrial growth, causing severe water pollution and acute stress and depletion of groundwater in several locations. Rapid urbanization and climate change have significantly increased vulnerability to floods. Environmental degradation has also reached levels that compromise public health and livelihoods, particularly for the poor. Sustainable management of the basin's river and groundwater became critical to the social and economic development of the country.[2]

2. The Asian Development Bank (ADB) approved a $503.8 million multitranche financing facility (MFF) for the Integrated Citarum Water Resources Management Investment Program (ICWRMIP) on 4 December 2008 to support the implementation of integrated water resources management (IWRM) road map in the CRB.[3] The expected impact was reduced poverty and improved health and living standards in the CRB. The outcome was improved IWRM in the CRB. The program had eight outputs: (i) institutions and planning for IWRM; (ii) water resource development and management; (iii) water sharing; (iv) environmental protection; (v) disaster management; (vi) community empowerment; (vii) data and information; and (viii) project management. The program was to be delivered in four tranches. The Directorate General for Water Resources (DGWR) under the Ministry of Public Works and Housing (MPWH)-previously was the Ministry of Public Works, was the executing agency.

3. The periodic financing request 1 (PFR1), with loans of (i) $20 million from ordinary capital resources (Loan 2500-INO); and (ii) $30 million equivalent from the Asian Development Fund (Loan 2501-INO) was formulated to implement priority activities from the road map. The expected impact of PFR1 was improved and more IWRM in place, with the government and the community working in partnership toward a shared vision. The expected outcomes of PFR1 were (i) improved reliability of the water supply to Jakarta and irrigation areas supplied by the West Tarum Canal (WTC); (ii) improved water-use efficiency and increased yields for rice irrigation in three districts in the CRB; (iii) significant increase in the number of community- and nongovernment organization (NGO)-driven initiatives for improved water and catchment management in the CRB; and (iv) improved water quality in the waterways and reservoirs of CRB. PFR1 had 9 outputs, which are contributes to the MFF outputs. The project design and monitoring framework (DMF) and an evaluation of project achievements are in Appendix 1. To complement the loans, ADB also approved (i) a $3.75 million grant from the Global Environment Facility to implement sound biodiversity conservation in the CRB using a landscape approach,

[1] The water is carried to Jakarta and its metropolitan conurbation through the West Tarum Canal, which was constructed in 1966.

[2] ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Grant and Technical Assistance Grant Republic of Indonesia: Integrated Citarum Water Resources Management Investment Program.* Manila.

[3] The road map consist of interventions needed to achieve integrated river basin management in Citarum River Basin, with estimated cost of $3.5 billion.

and covering both protected and peripheral areas;[4] and (ii) $8 million in technical assistance to strengthen institutions.[5]

4. Due to the limitation of financing, in 2010, the government requested ADB to prepare the second tranche with a focus on bulk water supply (BWS) and watershed improvement in the upper CRB. ADB considered the proposal as an exceptional circumstance and a high priority to advance the IWRM agenda in the CRB, thus, approved a project preparatory technical assistance (PPTA) in September 2011.[6] However, the financing required for the viable BWS options, combined with watershed rehabilitation activities, did not justify ADB investment due to the high transaction cost and limited scope of works. As a result, ADB and the government agreed to drop the second tranche from the Indonesia Country Operations Business Plan, 2015–2017, and to close the MFF after PFR1 completion.

II. DESIGN AND IMPLEMENTATION

A. Project Design and Formulation

5. The investment program, PFR1, and the grant were designed in accordance with the government's Medium-Term Development Plan 2005–2009,[7] which aimed to halve the percentage of the population below the poverty line by improving, among other things, infrastructure, water supply, and sanitation. With ADB support, the government developed a road map for IWRM in the CRB. The investment program, PFR1, and the grant aimed to implement the road map and the government's Law No. 7/2004 on Water Resources, in which IWRM and the sustainable use of water were emphasized. The investment program sought to help the government address the increasingly rapid extraction, usage, and pollution of water caused by the domestic, industrial, and agriculture activities. It also sought to enhance the government's rice production targets by increasing irrigation in key production areas in West Java. The grant directly contributed to the implementation of the Ministry of Forestry Strategic Plan 2010–2014,[8] which emphasized biodiversity conservation as a priority of Indonesia's forest management policy. This grant was in line with the Fourth Replenishment of the Global Environment Facility focal area strategy goal to achieve conservation and sustainable use of biodiversity and the maintenance of ecosystem goods and services. Improvement of the CRB was also a priority for West Java Province.

6. The investment program, PFR1, and the grant were also relevant to ADB's Country Strategy and Program (CSP), 2006–2009.[9] The investment program was directly in line with one

[4] G0216-INO: Citarum Watershed Management and Biodiversity Conservation Project, located at eight conservation areas that are managed under the two project implementation units (PIUs) of BBTNGGP (Balai Besar Taman Nasional Gunung Gede Pangrango) (Mount Gede Pangrango national park) and BBKSDA (Balai Besar Konservasi Sumber Daya Alam) (West Java Province nature reserve bureau): (1) Mount Burangrang Nature Reserve, (2) Mount Tangkuban Perahu Nature Reserve, (3) Mount Tangkuban Perahu Natural Tourism Park, (4) Mount Masigit Kareumbi Hunting Park, (5) Kamojang Cauldron Nature Reserve, (6) Kamojang Cauldron Natural Tourism Park, (7) Mount Tilu Nature Reserve, and (8) Mount Gede Pangrango National Park.

[5] TA7189-INO: Institutional Strengthening for Integrated Water Resources Management in the 6 Ci's River Basin Territory funded by the government of the Netherlands and the Multi-Donor Trust Fund under the Water Financing Partnership Facility. The TA amount was increased with an additional $2.55 million from the Climate Change Fund (2010) and $1 million from the government of the Netherlands (2012).

[6] ADB. 2011. *Technical Assistance to the Republic of Indonesia for* Integrated Citarum Water Resources Management Investment Program Periodic Financing Request 2. Manila (TA 7871-INO).

[7] National Medium-Term Development Plan 2005–2009 was the first stage of the National Long-Term Development Plan 2005–2025 introduced in 2005 to achieve the vision of sustainable development.

[8] The Forestry Strategic Plan for 2010–2014 was issued in 2010 to achieve the vision of forestry development.

[9] ADB. 2006. *Country Strategy and Program (2006–2009): Indonesia.* Manila.

of the five operational areas specified in the CSP, which was strengthened environment and natural resources management, with enhanced water and marine resources management and reduced pollution as indicators. The CSP highlighted that the management of water resources play a prominent role consistent with ADB's water financing initiative. Improving the sustainable use of water is in line with ADB's Water for All policy.

7. Stakeholders were consulted and participated at various stages of the investment program preparation such as (i) formal public consultation workshops to present and discuss assessment of development issues, project identification and prioritization criteria, feasibility study recommendations, and subsequent basin roadmap development; (ii) focus group discussion in key parts of the basin impacted by the program; and (iii) meetings and interviews with government officials at national, provincial and district levels, as well as key informants (water utility executives, NGOs, personnel working on related projects in the basin).

8. ADB provided a PPTA to help the government formulate the investment program.[10] The PPTA supported the IWRM road map through extensive consultations with key stakeholders in all relevant sectors and levels. The road map set out the agreed interventions up to 2023 that will be required to achieve the specific objectives set for each key area. The initial estimate of the cost of the interventions is $3.5 billion. The MFF was the suitable lending modality given the need to have a long term and the investment size needed to improve the river basin management. However, the subsequent tranches after the first tranche did not have required project readiness level to continue the MFF modality.

9. Except for minor changes in scope and implementation arrangements of the Ministry of Environment and Forestry (MOEFr), Ministry of Health (MOH), and Ministry of Agriculture (MOA) components, the PFR1 project design was not changed much during implementation. While PFR1 and the grant were implemented as formulated during appraisal, the investment program was not rolled out as planned. At completion, the project remained relevant to the government and country partnership program. The government issued a presidential decree in beginning of 2018 to continue the river basin restoration.

B. Project Outputs

10. The investment program had eight planned outputs, which is partly reflected in PFR outputs. Approximately 80 interventions, spread over four tranches, were anticipated at appraisal. The outputs related to PFR1 implementation were partially achieved and contributed to the investment program outputs.

11. **Periodic Financing Request 1.** The PFR1 had nine subcomponents funded under the loans and grant to implement priority activities from the IWRM road map. Each subcomponent was implemented by one ministry, and each subcomponent reflected each output of PFR1.

(i) BAPPENAS – Subcomponent 1.1: Road Map Management

12. The implementation began in October 2010, and was completed in August 2014. A roadmap coordination and management unit (RCMU) was established under the Directorate of Water Resources and Irrigation, BAPPENAS (the national planning agency), to ensure overall planning. It facilitated coordination among stakeholders (central, provincial, and district

[10] ADB. 2004. *Technical Assistance to the Republic of Indonesia for Preparing the Integrated Citarum Water Resources Management Project*. Manila (TA 4381-INO).

governments) to finance the IWRM road map. As required under the water law, the MPWH developed the strategic water resources plan (*Pola)* and its implementation plan (*Rencana)* for the CRB.[11] The *Pola* and *Rencana* development capitalized on the road map and was supported by the TA. The road map was then updated to ensure consistency with the *Pola* and *Rencana* and handed over to the CRB water council. The CRB road map was complemented by an atlas; an integrated agenda of investment packages; and an interagency coordination guideline. A media and communication campaign was also carried out to disseminate the road map and raise awareness of subnational agencies. Seventeen community pilot activities involving eleven civil society organizations (CSOs) were supported to increase public participation in IWRM at the grassroots level. The mobilization of financing for the subsequent road map interventions was not achieved as planned. However, inspired by the road map works, the provincial government developed its own IWRM program in 2014 starting with an upstream restoration program.[12]

(ii) *Balai Besar Wilayah Sungai Citarum*, Ministry of Public Works – Subcomponent 2.1: Rehabilitation of West Tarum Canal

13. The detailed engineering design (DED) and bidding documents for the Bekasi Syphon were prepared during the PPTA of PFR1. Despite advance procurement action initiated in February 2009, the construction works for the Bekasi Syphon began only in June 2010. Due to additional works necessitated by landslides and floods, the Bekasi syphon works were not completed until June 2015 (60 months of construction, from the original plan of 29 months). Bekasi syphon construction improved the water quality of the supplied bulk water for Jakarta. The main work under this subcomponent was the rehabilitation of WTC, through two civil works packages. Those works have experienced significant delays. The recruitment of the consultants to prepare the DED took longer than expected at the project appraisal stage. Furthermore, it took about 24 months for the government to issue a decree for the provision of compensation to the affected people to comply with the agreements set in the resettlement framework. Package 1 began in November 2013 and was completed in April 2016 and Package 2 was implemented in February 2013 and completed in May 2016. Despite the delays, WTC has been successfully restored to its original capacity of 31 cubic meters per second (m^3/s) as agreed in the beginning of rehabilitation design.[13] Water volume in the head of canal (*Bendung Curug*) started increasing in 2014, after constant decrease since project appraisal in 2007. Although the target of increased canal capacity was achieved, the average water volume in 2017 (43.6 m^3/s) was almost similar with the volume in 2007 (before the project), which was 43.8 m^3/s because the additional canal capacity had not been fully utilized at project completion as the additional water treatment plan capacity had not been constructed and the secondary irrigation canal had not been developed/rehabilitated. The works also completed the rehabilitation of operational water control structures along the canal, such as the cross drain and trash rack. There was no disruption of the water supply to Jakarta during canal rehabilitation works.

(iii) Ministry of Agriculture – Subcomponent 2.2: Improved Land and Water Management

14. This subcomponent introduced the system rice intensification (SRI) approach to increase yield and reduce water consumption.[14] Activities under this subcomponent benefited 3,000 ha of

[11] Supported by TA 7189-INO, which was started in 2009.
[12] The Citarum Bestari program was started with the first 70 km upstream restoration program, with a target of 20 km per year.
[13] The canal capacity before rehabilitation was 16 m^3/s.
[14] Low water consumption and organic rice farming methodology.

rice fields (650 ha in Bandung District; 1,000 ha in Subang District; and 1,350 ha in Karawang District). The MOA implemented this subcomponent from 2009 to 2011, through the district agriculture agencies, as envisaged during appraisal. The introduction of SRI reduced water utilization for agriculture (by 38% based on secondary data) and increased yields up to 36% through organic agricultural practices. SRI activities benefited 26,000 rice farmers and increased the farmers' incomes because of higher yields and lower cost of fertilizer. The availability of organic fertilizer was secured by providing the farmers with cows. In 2015 and 2016, MOA implemented upland management activities in the CRB. Those activities have been financed with savings from the SRI activities and covered 160 ha of agricultural land. The focus was on sustainable agricultural practices for watershed management and land conservation. In 2015, it was initiated with funding from the government and continued in 2016 using a loan for four farmer groups in Bandung and West Bandung districts. The activities included land terracing, planting hard vegetation for intercropping, composting, and small reservoir construction.

(iv) Ministry of Health – Subcomponent 2.3: Support for Community- and NGO-driven Initiatives for Improved Water Supply and Sanitation

15. Activities under this subcomponent were fully integrated with the WTC rehabilitation to address water supply and sanitation problems for communities living along the canal. The subcomponent was implemented by the MOH and corresponding agencies at the district level in a timely manner between 2009 and 2014. MOH was able to reach 25 villages from the original target of 15 villages, covering three districts, along the WTC. In 2013, the Ministry of Environment (MOE) cancelled the civil works, equipment, and training allocation ($2.3 million) under Loan 2501. Loan savings ($1.5 million) from the MOE subcomponent was shifted to the MOH to expand to two additional districts in the upper CRB. Supported by the community facilitators, community groups were established to operate and maintain the built facilities.[15] The facilitators were recruited through NGOs in each district. After 2 years of operation, most of the water supply facilities have doubled or tripled the number of customers. Several solid-waste recycling management facilities stopped their operations, mainly due to the high competition with the existing market for the recycled waste, which reduced the incentive for the community groups to maintain the operational cost of the facilities. This subcomponent delivered more outputs than expected at appraisal due to optimization and addition of the budget during implementation.

(v) *Balai Besar Wilayah Sungai Citarum*, Ministry of Public Works – Subcomponent 2.6: Detailed Engineering Design for Upgrading of Bandung Water Source and Other Uses by Inter-Basin Transfer

16. This subcomponent did not materialize. The allocated loan for the design of BWS infrastructure, to be potentially financed under PFR2, amounted to only 5% of the required budget. This small allocation was the consequence of the government's decision to prioritize PFR1 implementation, with the expectation that it could increase when savings under PFR1 were identified. While significant savings were secured due to the depreciation of the Indonesian rupiah, the government prioritized PFR1 by expanding some of the well-performing subcomponents during the first loan extension in 2014. The PPTA provided by ADB to help the government formulate the PFR2 did not result in bankable BWS options with a high level of

[15] The community working groups were established and community training was conducted. Twenty-five community work plans were prepared to construct 29 water supply facilities, 28 units for community sanitation, and 27 units of community solid-waste treatment and recycling facilities. The program has benefited 201,630 people along the WTC and in two upstream villages.

readiness for implementation. In 2016, the executing agency submitted a proposal to use additional savings for the DED of BWS infrastructure. However, this proposal was not accommodated by the Ministry of Finance as another loan extension would have been necessary, exceeding the grace period for loan repayment.

(vi) Ministry of Environment and Forestry – Subcomponent 4.1: Development and Implementation of a Basin River Quality Improvement Strategy and Action Plans

17. This subcomponent was carried out by the MOE (now MOEFr) from 2011 to 2015. Implementation under this subcomponent suffered significant delays. The MOE only mobilized its consultants in 2014. Unfamiliarity with ADB procurement guidelines and lack of leadership seriously constrained the delivery of services under this subcomponent. Despite the 4-year delay, the following deliverables were produced: (i) a water quality improvement strategy for the CRB; (ii) a community action plan for point source management of water quality; and (iii) a water quality monitoring and database system. Small pilots for water quality improvement were also implemented with communities. The MOE cancelled the civil works, equipment, and training allocation ($2.3 million). While most of the DMF output indicators have been achieved, the output of improving the capacity of provincial and district environmental agencies and implementation of water quality interventions have not been met.

(vii) Ministry of Environment and Forestry – Subcomponent 4.2: Citarum River Basin Catchment Management and Biodiversity Conservation (Grant 0216 – INO)

18. Under this grant-funded component, there were four subcomponents implemented by the Ministry of Forestry (now MOEFr) and the two national park agencies. The grant focused on biodiversity inventory, habitat restoration, payment for ecosystem services (PES), and mainstreaming biodiversity in the production landscape in eight conservation areas. Biodiversity inventory and habitat mapping were conducted as the basis to develop the biodiversity management action plans in the conservation areas. The maps in those areas were updated using high-resolution satellite imagery. A web-based management information system (MIS) was also developed. The staff of the MOEFr involved in conservation area management benefited from the capacity-building program to better implement the biodiversity management action plans. The project supported a restoration and land rehabilitation pilot covering 106.3 ha of degraded forest. A road map for ecosystem conservation and restoration which covered four conservation areas of approximately 1,551 ha was produced, with cost estimates based on various levels of ecosystem degradation. Four hundred villagers involved in conservation model groups benefited from training in composting, seedbed-nursery and participatory restoration monitoring and evaluation. Three voluntary PES schemes were piloted between water users and conservation village groups upstream. One pilot PES has been formalized through an agreement between a water-user group that extracts water from springs and the upstream conservation village community group. The grant supported the establishment of 13 conservation village models (CVMs). The community training covered entrepreneurship, organic farming, and composting. Along with the conservation village program, alternative livelihoods were also developed. The effectiveness of management of conservation areas before and after the project was measured by biodiversity tracking tools, which are generally increased in each of the conservation areas. A separate grant completion report is presented in the Supplementary Appendix.

(viii) *Balai Besar Wilayah Sungai Citarum*, Ministry of Public Works – Subcomponent 8.1: Program Management: The Program Management Unit (PMU)

19. The PMU was established in August 2009 under the *Balai Besar Wilayah Sungai Citarum* (BBWSC). Its supporting consultant was mobilized in 2010. The PMU conducted quarterly project implementation unit (PIU) meetings to discuss implementation issues, actions, and financial audit findings. The PMU regularly prepared and disseminated monthly and quarterly reports to ADB and the implementing agencies. The PMU also supported each PIU in procurement, social and environment safeguards compliance, and financial audit matters. At project start-up, a communication specialist helped improve coordination among the PIUs under different ministries. The PMU supported coordination meetings of the related government stakeholders and the PPTA consultant for the preparation of PFR2. Overall, this subcomponent delivered the outputs envisaged at appraisal.

(ix) BAPPENAS – Subcomponent 8.2: Independent Monitoring and Evaluation

20. Starting in 2012, this subcomponent systematically tracked the progress of the road map implementation. Several monitoring and evaluation tools have been developed to this end, including a score-card system, and a web-based monitoring system involving various community groups. The expected outputs have been successfully delivered. Under RCMU supervision, the consultant collected a large amount of information up to the district level. Recommendations to improve the delivery of the road map, including the investment program, were disseminated to the provincial and district governments, but did not result in significant increase in provincial and district governments budget allocation to finance the IWRM roadmap.

C. Project Costs and Financing

21. At appraisal, the project cost for PFR1 was estimated at $103.42 million; at completion (as of April 2017) it was $63.84 million, or 62% (Appendix 2) of the appraisal due to loan, grant and TA savings, less government's counterpart funding, depreciation of Indonesia Rupiah against the US dollar, and cancellation of TA parallel financing from K-Water (Appendix 3). For the loan fund, the total disbursement at project completion was $41.8 million (84%) of the total loan of $50 million at appraisal. This was primarily due to the depreciation of the Indonesian rupiah against the US dollar, since most of the contracts are in rupiah. During project implementation, there were some minor changes between the budget categories and between the allocations for each subcomponent. Those changes were justified on technical grounds. Increases in subcomponent allocations were not due to cost overruns. During appraisal, the central government was expected to provide $18.11 million in counterpart funding for PFR1 implementation. The actual government cash contribution as of January 2016 (based on disbursements) was $5.89 million, or 33% of the projection at appraisal. This proportion is skewed by the depreciation of the rupiah. There was a plan for a second loan extension in 2016 to utilize the loan savings. This proposed extension was to be used for additional works along the WTC, and for consulting services to prepare a feasibility study for priority road map interventions and the DED for selected BWS options under the second tranche. However, the government and ADB agreed not to pursue this extension as the new completion date of the PFR1 would have exceeded the loan repayment date. Therefore, a significant portion of the PFR1 loans was not utilized. Based on the sensitivity analysis during project appraisal, a project cost decrease with the same project benefit gained would likely increase the economic and financial rates of return. The grant total cost and disbursement was $3,614,678, or 96% of the cost at appraisal. The government provided $301,323 in counterpart funds for the grant, compared to $375,000 estimated at appraisal.

D. Disbursements

22. The loan disbursement was delayed from the original projections prepared during appraisal. This delay was mainly caused by: (i) delays in procuring consulting services for the subcomponents under the MOE and DED (subcomponent 2.1); and (ii) the resettlement process for the WTC rehabilitation. The loan used direct payment (for civil works and large consulting service contracts) and an imprest account (for smaller contracts) for disbursement. The loan proceeds were disbursed in accordance with ADB's *Loan Disbursement Handbook* (2007, as amended from time to time). The executing agency and the Ministry of Finance managed the imprest account properly and in accordance with ADB's *Loan Disbursement Handbook*. No significant issues arose during implementation. For the grant, an imprest account for all expenditures was established. The loan projection and actual disbursements and contract award were shown in Appendix 4 and 5.

E. Project Schedule

23. PFR1 and the grant suffered significant delays during implementation. Both the PFR1 loans and grant were extended for 23 months from the original closing dates. Delays in procurement for several consulting services and civil works packages were mainly due to limited understanding of ADB's procedures for the recruitment of consultants and the procurement of works. The lengthy resettlement process for the WTC rehabilitation also negatively affected the overall delivery of PFR1. On the other hand, the loan and grant extensions enabled additional works that enhanced project achievements. The project main events are described chronologically in Appendix 6**.** The delivery of the soft subcomponents did not vary much from the appraisal estimates, except for a subcomponent of the MOEFr for the river basin quality improvement strategy.

F. Implementation Arrangements

24. The implementation arrangements as outlined in the Report and Recommendation of the President were followed. The DGWR was the executing agency and was responsible for overall implementation of the investment program. The DGWR established the PMU in BBWSC as the river basin organization under DGWR to coordinate with all PIUs. The eight loan-funded subcomponents were implemented by the five ministries, and the grant was implemented by the MOEFr.

25. The PMU was tasked with ensuring that the various PIUs were well-coordinated in annual planning, budgeting, monitoring, compliance, and reporting. The project's organizational structure reached downward to the subnational level for the subcomponents under the MOH and MOA. Implementation involved the corresponding sector agencies at the provincial and district levels. The implementation arrangement for MOA and MOH subcomponents could not be applied for the subcomponent under MOE as the ministry does not have direct working arrangement with the subnational level. At the field level, the project engaged with local communities, CSOs, and NGOs through the MOA, MOH, MOE, BBWSC (WTC rehabilitation), and BAPPENAS.

G. Technical Assistance

26. ADB approved an advisory TA of $8 million.[16] Additional financing of $2.55 million was approved in 2010 for the climate change component. In 2012, ADB further increased the TA amount by $1 million for additional capacity-building and for additional analytical works for upper CRB flood risks management. The TA provided institutional strengthening and management support, and supported the formulation of river basin management plan for the river basins of the Citarum, Ciliwung–Cisadane, and Ciujung–Cidanau–Cidurian.[17] The TA has delivered the following outputs: (i) synchronized planning mechanisms among the central, provincial, and district governments for CRB road map investment; (ii) capacity building for the three river basin organizations to develop their water resources management strategic plan and master plan for the 6 Ci's river basin territory (*Pola* and *Rencana*) using the Java Spatial Model; (iii) a hydrodynamic model and flood risks management strategy for the upper CRB; (iv) a water resources management decision support system for CRB; and (v) a climate change mitigation and adaption strategy for CRB complemented by pilot projects. A book on River Basin Management Planning in Indonesia as a knowledge product was also published under the TA. Overall, the TA was satisfactory. The TA completion report is in Appendix 7.

H. Consultant Recruitment and Procurement

27. The executing and implementing agencies adhered to ADB's guidelines for the recruitment of consultants and procurement of goods and works. Goods, works, and equipment were procured in accordance with the procurement plan and ADB's Procurement Guidelines (2007, as amended from time to time). Community packages were procured in line with procedures agreed upon in the project administration memorandum (PAM). Seven consultant packages were recruited, and three civil works packages procured for PFR1. The consulting services package under the MOA subcomponent was cancelled due to the MOA's decision to implement activities without consultant support. The following consulting services experienced significant delays in recruitment: (i) under BBWSC, the DED consultant for the WTC rehabilitation was delayed by 1 year. This was due to the long contract negotiation process between the first-ranked firm and the government. The contract was awarded to the second-ranked firm in 2010, 1 year after the project's effective date, despite the advance procurement action; and (ii) the recruitment of the consulting services package under the MOE sub-component was delayed for 4 years.[18] This was mainly due to slow decision making, unfamiliarity with ADB procurement guidelines, and the recurring changes of the consultant terms of reference. The delayed recruitment of the WTC DED and civil works supervision consultant negatively affected the WTC rehabilitation, as the DED was accordingly delayed. Two civil works packages were procured through international competitive bidding and one civil works package was procured through the national competitive bidding. For all civil works packages, evaluation of bids took longer than expected due to several ADB comments to be clarified.

28. The performance of the consultants, contractors, and community facilitators were satisfactory. Construction works for the WTC rehabilitation subcomponent benefited from the experience and knowledge of the consultant who prepared the DED and who also supervised

[16] ADB. 2008. *Technical Assistance to the Republic of Indonesia for Institutional Strengthening for Integrated Water Resources Management in the 6 Ci's River Basin Territory*. Manila (7189-INO).

[17] The government designated the sub-basins of a new natural planning unit territory of national strategic importance, important for the future water supply of Jakarta and its satellite urban and industrial areas, and it has been termed the "6 Cis River Basin Territory."

[18] The shortlist was approved on 6 December 2007, or 19 months before loan effectiveness.

the works. There was a high turnover of team leaders under the consultant package of subcomponent 1.1. This hampered the activities under this subcomponent at an early stage.

I. Safeguards

29. The investment program and PFR1 were categorized as B for environment, A for involuntary resettlement, and C for indigenous people. An environmental assessment and review framework and a resettlement framework were approved by ADB in 2008 before ADB approved the ICWRMIP MFF. These frameworks describe the anticipated safeguards impacts, clarify safeguard principles and requirements for screening and categorization, social and environmental assessment, and guide the implementation of social and environment safeguard plans of subprojects prepared under the MFF.

30. A resettlement plan (RP) and initial environment examination were prepared for the WTC rehabilitation sub projects and approved in 2008. The RP for the WTC was updated in 2011-2012 after the completion of the WTC DED. The number of the affected households increased from 872 to 1,320. The implementation of the updated RP was delayed because of lengthy process to settle the compensation and assistance for non-land rights holders. The compensation payment was completed in 2015, while livelihood restoration program was completed in 2016 in accordance to provisions set forth in the updated RP. External monitoring was conducted to verify the internal monitoring information and to ensure achievement of resettlement objectives, and advice on safeguard compliance. Semi- annual environmental and quarterly social monitoring reports were submitted to ADB and posted on ADB website. There was no complaint raised by the affected persons on the compensation payment and assistance.

31. Since project processing in 2008, NGOs have raised concerns related to environment and resettlement. In 2010–2011, a group of NGOs complained that ADB violated its policies on involuntary resettlement. The Indonesia Resident Mission (IRM) project team closely coordinated with the Office of the Special Project Facilitator and Office of the Compliance Review Panel to address the complaint in collaborative manner.[19] IRM actively coordinated with the executing agency (EA) and local governments to accelerate the resettlement activities and properly address the issues. A series of policy dialogues were conducted to agree on the legal justification on the compensation to the affected persons who are non-land rights holders (squatters). A semi-annual monitoring report on implementation of CRP's recommendations were submitted to ensure compliance with ADB safeguards policy. The CRP issued the final monitoring report on its recommendations in December 2015 as the subsequent tranches of the MFF would not be implemented.

J. Monitoring and Reporting

32. Under L2500-INO all loan covenants are complied with. Under L2501-INO and the MFF framework financing agreement (FFA), three covenants and undertakings are partially complied with and three covenants and undertakings are not complied with. The partial compliances include (i) performance monitoring systems and reviews (LA 2501-INO, schedule 5, para. 20),

[19] In 2010, a NGO filed the complaint related to local eviction conducted by the local government which the Office of the Special Project Facilitator (OSPF) ruled as ineligible. In 2011, a NGO alliance, representing three affected persons, filed the similar complaint which was ruled eligible under the consultation phase of accountability mechanism. Various consultation activities were carried out by OSPF to address the complaint. Tracking the evicted persons recommended by OSPF was conducted and included in the updated RP. In 2012, the complainants registered a request for a compliance review under the Accountability Mechanism. The CRP ruled the complaint eligible.

as PMU did not prepare the separate annual performance monitoring systems as required; (ii) the National Steering Committee for Water Resources biannual road map progress report (FFA, schedule 3, para. 9), as the road map progress was not reported biannually as required; and (iii) establishment of a website for the project with postings on financial statements and tract procurement contract awards (LA2501, schedule 5, para. 13), as the website for the project did not contain the required information to facilitate tracking of procurement contract award. The website for the project was established and administered by BAPPENAS. The information provided on that website should be completed to facilitate tracking of procurement contract award. The covenant and undertakings that were not complied with include (i) submission of a state of annual basin report (FFA, schedule 6, para. 5; LA 2501, schedule 5, para. 10); (ii) issuance of the first annual "State of the Citarum River Basin" report (LA 2501, schedule 5, para. 31), and (iii) reforms to move from voluntary controls for polluters to a system based on legal enforcement and financial incentives (LA2501, schedule 5, para. 29). Law enforcement level was low and regulatory framework for financial incentives had not been developed. Under Grant 0216-INO, one covenant was partially complied with. The regular reports to ADB were not submitted timely during the grant implementation. No loan covenants were modified, suspended, or waived. The status of grant and loan covenants is in Appendix 8.

33. Quarterly project monitoring reports on the progress of each project component under the project implementing units were submitted by the PMU to ADB as required in the loan covenant and DMF. Project inception review mission, as well as mid term, semi annual, and project completion review missions were fielded by ADB.

34. The audited loan and grant and financial statement reports were submitted yearly, 6 months after the fiscal year. The audit opinion in all reports were unqualified.

III. EVALUATION OF PERFORMANCE

A. Relevance

35. The investment program was *relevant* given the strong government priority to have a productive and clean river water management in one of the strategic river in the country. The modality was appropriate as it provided a long term commitment for financing the IWRM roadmap. However, the MFF approach was hampered by the lack of project readiness for the subsequent tranches. This resulted in cancellation of the subsequent tranches. The PFR1 is rated *relevant*. They directly supported national development priorities. They were in line with ADB's country strategy, and supported the government development objectives and operationalization of the water law and the IWRM agenda. The IWRM road map also supported the national planning for IWRM. The minor changes made during implementation enhanced the likelihood of achieving project outputs, outcomes, and impacts.

B. Effectiveness

36. The investment program is rated *ineffective* because the outcome was not achieved. The PFR2 and subsequent tranches did not materialize. To process a PFR2, the government would have required a high level of project readiness, including a DED, land acquisition, and environmental permits. While key activities for PFR2 and subsequent tranches were identified during appraisal, the government was not able to develop infrastructure subprojects for a second tranche with a high level of readiness. The subcomponent under PFR1 to prepare the DED did not materialize because it will need a second loan extension that would exceed the grace period of loan repayment.

37. PFR1 is rated *less than effective* in achieving the full outcome. One of the PFR1 outcomes (improved water quality in CRB waterways and reservoirs) as part of the subcomponent 4.1 was not fully achieved. While water quality improvement action plans had been prepared at the district level, there was uncertainty about whether those plans would be mainstreamed into regional plans and budgeted for implementation. The investments originally planned at appraisal to implement those action plans were cancelled. Only small pilot projects were implemented instead. Three out of four outcomes were achieved: (i) improved reliability of water supply to Jakarta and irrigation areas supplied by WTC; (ii) improved water-use efficiency and increased yields for rice irrigation in three districts in CRB; and (iii) a significant increase in the number of community- and NGO-driven initiatives for improved water and catchment management in the CRB. Despite delays, the WTC was rehabilitated to its original capacity of 31 m^3/s and the Bekasi syphon was built as envisaged at appraisal, and delivery rate of water supply to Jakarta was increased from $16m^3/s$ to $21m^3/s$. At the end of the project, however, the canal capacity has not been fully utilized as the additional water treatment plan has not been built, and the secondary irrigation infrastructures have not been rehabilitated or constructed. The MOA successfully implemented the SRI program in three districts of the CRB (3,000 ha) with improved water-use efficiency (38%, based on secondary data), and increased yield up to 36%. BAPPENAS, MOH, MOA, and MOEFr supported the communities and NGOs to improve water and catchment management (water and sanitation, solid-waste recycling, conservation agriculture practices, and watershed conservation villages) to increase 50 initiatives.

38. The grant outcomes were successfully achieved by implementing (i) mainstreaming biodiversity considerations through institutional strengthening and legal, policy, and planning processes; (ii) biodiversity inventory and habitat mapping for improved conservation area management, planning, and action; (iii) pilot projects for forest habitat restoration within eight conservation areas; (iv) sustainable financing for biodiversity conservation through PES; (v) mainstreaming biodiversity conservation in the production landscape through model conservation villages; (vi) community-based preparation, capacity building, and training; and (vii) geographic information system development for biodiversity conservation. Biodiversity management action plans in each of the conservation areas were developed through a participatory process. The PES pilot schemes were developed despite the need for a comprehensive policy analysis to support a reform for sustainable financing for biodiversity conservation.

39. The gender action plan was prepared and implemented for the PFR1 to ensure gender equality in the project benefits and to actively engage women in subproject design and implementation to respond to their specific needs. Sub components under MOH and MOA monitored the female participation in project activities. For community water and sanitation activities, women percentage in community water and sanitation groups, community facilitators, meeting participation, and community trainings reached 30% on average. On the safeguard implementation, delays occurred for the implementation of the updated RP due to the policy gap of payment to the illegal settlers as the affected people. The governor of West Java issued a decree for compensation unit rate in 2013, and compensation payment was completed in 2015 in accordance with the updated project RP.

C. Efficiency

40. The investment program is rated *inefficient* because only one tranche was delivered out of the planned four tranches in 15 years of MFF availability. The PFR1 is rated less than *efficient* as the intended outputs and outcome were not fully achieved within the loan budget. Loan allocation to prepare the follow-up PFR was not timely allocated, and the project was

extended for 23 months. Project start-up delays along with long procurement and resettlement processes necessitated the extension. The total loan and grant disbursement reached 84% and 93%, respectively. The economic internal rate of return declined slightly compared to appraisal (27.8%), but remained high (23.7%) at completion. The economic internal rate of return at appraisal was based on estimated benefits due to (i) potential increase in water supply to domestic, municipal and industrial users; and (ii) increased in paddy cultivation productivity. The project completion report analysis considers the same sources of benefits yields, but updates all relevant parameters on costs, water supply forecasts, cropping intensity, and per-hectare farm income of paddy and maize. In line with the appraisal analysis, the project completion report does not consider health benefits resulting from increased water supply for sanitation, or environmental benefits due to reduction in soil erosion, landslide, and flooding.

41. At appraisal, WTC's raw water tariff was less than 35% of operation and maintenance (O&M) costs. Although tariffs have increased in subsequent years, the data indicates that they are still insufficient to recover the O&M costs. A more appropriate measure would be the operating expense ratio, which expresses operating costs as a percentage of operating revenue, and measures to what extent an entity is self-sustainable. The average operating expense ratio is 1.38, reduced from the 2008 level of around 2.86 but is still greater than unity, indicating that WTC's operating costs is greater than operating revenue. Unless tariffs can be adjusted periodically, WTC operator as a state-owned enterprise would continue to rely on government budgetary support to cover the operating shortfall. Details of the economic and financial analysis are in Appendix 9**.**

D. Sustainability

42. The investment program is rated *unlikely sustainable*. While the government continues the program with its own funding, its budget allocation is much less than what the investment program planned for investment. The investment program only partially delivered its intended outputs to enable the investment to be sustained. PFR1 is rated *likely sustainable*. PFR1 introduced good practices in IWRM planning, which the government has benefited from. The road map and the basin planning documents (*Pola* and *Rencana*) prepared under PFR1 have been handed over to the river basin council, mandated by the country water law for IWRM coordination. The *Pola* was legalized by the MPWH in 2014, and the *Rencana* in 2016, providing a strong legal basis for implementation and budget allocation. In addition, the provincial government launched the Citarum restoration program in 2014, starting with the upper CRB, with an annual target of 20 km of river improvement. *Perum Jasa Tirta* II (PJT II)—a state owned company that operates the WTC—committed to allocate funding for O&M for WTC. PJT II's annual O&M budget has been increasing over the past 3 years. Some activities implemented under PFR1 are being replicated. In 2014, the MOA expanded the application of the SRI approach fourfold to cover an additional 12,700 ha in the three districts covered by PFR1. Through its national programs, the MOH has been implementing community-based initiatives for improved water supply and sanitation.

E. Development Impact

43. The expected impact of the investment program was reduced poverty and improved health and living standards in the CRB by 2023. As PFR2 and following tranches have been cancelled, the investment program's impact will not be fully achieved, therefore, it is rated *less than satisfactory*. The PFR1 expected impact was "improved and more integrated water resource management in place." The achievement of the impact was tracked by three indicators: (i) an appropriate and effective institutional arrangement for IWRM in CRB;

(ii) effective partnership among the government agencies at the national, provincial, and district level to implement the basin plan; and (iii) comprehensive and accessible databases to implement IWRM. The first indicator has been achieved as the river basin council has been established, comprised of 50% government and nongovernment members, and the MPWH has legalized *Pola* (strategic basin plan) and *Rencana* (implementation plan). The second indicator was partially achieved. While there has been an initiative to incorporate IWRM into regional plans through the *Citarum Bestari*, the allocated budget is far less than the required financing. The third indicator was achieved. The government will, however, have to ensure that the necessary funding and human resources are allocated to maintain those databases. Therefore, PFR1 is rated *less than satisfactory*.

F. Performance of the Borrower and the Executing Agency

44. Overall, the performance of the borrower and the executing agency is rated *satisfactory*. Implementing agencies provided counterpart staff and funding as required. The executing agency, PMU, BAPPENAS, and the provincial governments managed to resolve the resettlement issue so that the main project component of WTC rehabilitation could be successfully completed. The RCMU under BAPPENAS performed well in its role to update and monitor the road map. It developed close coordination with the West Java province and districts targeted by the program. The Ministry of Finance, as the borrower representative, also provided timely and sound support for the PFR1 extension in 2014, and was actively involved in quarterly project monitoring conducted by BAPPENAS' multilateral directorate. The project would have benefited from (i) more counterpart staff assigned to the project and less staff turnover; (ii) streamlined decision-making process; and (iii) more involvement of the National Steering Committee for Water Resources, for strategic investment and future programs, including future investment program tranches.

45. The performance of the MOEFr, under which a PMU was established for the grant, was also satisfactory. Adequate counterpart staff and in-cash as well as in-kind contributions for the project were provided. However, a reporting flow between the grant and the loans was notably lacking.

G. Performance of the Asian Development Bank

46. ADB's performance was *satisfactory*. ADB conducted semiannual review missions that provided input and comprehensive guidance to improve implementation. Nine review missions were fielded during implementation of PFR1. IRM staff also participated in the quarterly monitoring meetings coordinated by BAPPENAS. The project was delegated in July 2010, which allowed IRM staff to provide timely support and guidance to expedite the recruitment of consultants, and address implementation issues as they arose. At the early stages of implementation, the project could have a better performance by less turnover of project officers.

H. Overall Assessment

47. The investment program is rated *unsuccessful*. Due to the small amount of funds allocated under PFR1 to design PFR2, and despite the provision of a PPTA by ADB, the second and subsequent tranches did not materialize. The PFR1 is rated *less than successful*. Because of the delays experienced during implementation, outcomes and outputs have not been fully achieved. However, poor communities along the CRB directly benefited from the projects. The PFR1 introduced institutional benefits into the basin by strengthening coordination and IWRM

planning. The grant is rated as successful. Despite the start-up delays, the grant fully achieved the intended outputs.

Table 2: Overall Ratings

Criteria	Rating	
	Tranche 1 (Final Tranche)	MFF
Relevance	Relevant	Relevant
Effectiveness	Less than effective	Ineffective
Efficiency	Less than efficient	Inefficient
Sustainability	Likely sustainable	Unlikely sustainable
Overall Assessment	Less than successful	Unsuccessful
Development impact	Less than satisfactory	Less than satisfactory
Borrower and executing agency	Satisfactory	Satisfactory
Performance of ADB	Satisfactory	Satisfactory

ADB = Asian Development Bank, MFF = multitranche financing facility.
Source: Asian Development Bank.

IV. ISSUES, LESSONS AND RECOMMENDATIONS

A. Issues and Lessons

48. **Design of IWRM investment should be selective**. Successful implementation requires simpler outputs, not involving too many ministries or too wide scope. Coordination among six different ministries was challenging and diverted the focus. PFR1 design should have focused on implementing a narrower slice of the IWRM roadmap. This would have allowed a greater focus to deliver all intended outputs, including improved water quality, mobilization of financial resources to implement IWRM roadmap, and preparation of follow up tranches.

49. **The mandate of each implementing agencies should be adequately assessed at appraisal to ensure achievement of all the project outcome and outputs**. The components under the MOA and MOH were implemented efficiently and in a timely manner as both ministries have existing models to work with local governments. Unlike that of the MOA and MOH, the MOE's component was not in line with its mandate, which is centered around the formulation of policies and regulations, and monitoring. The original design of the water quality improvement component included investments at the local level. The component had to be restructured with a focus solely on the formulation of water quality action plans.

50. **Adequate planning is needed for involuntary resettlement category A project.** While the main steps for resettlement were laid out in the resettlement framework and the RP for the WTC subproject, the project would have better performed with: (i) more details on resettlement in the PAM to avoid unnecessary delays in implementation; (ii) an agreement during project design and detailed in the PAM on recruitment and the estimate cost for the agency and facilitators for updating the RP and livelihood restoration program, the external resettlement monitoring agency, the certified appraiser to determine the compensation rates, and the consultant to support implementation of the livelihood restoration program; and (iii) better coordination with local governments to avoid the eviction of the affected people before the resettlement process started. Despite that the local government agencies implemented some project activities—such as water supply, sanitation, and SRI—, the local governments felt that the WTC rehabilitation benefited only Jakarta, which resulting in lower interest to help with resettlement issues. Clear water allocation plan from additional WTC rehabilitation between Jakarta and the local governments will certainly help to increase the project ownership by the

local governments. The policy gap for resettlement and compensation should be well anticipated and mitigated as early as possible. The land acquisition law of 2012 is a strong policy basis for harmonized, innovative, and mutually acceptable guidelines for resettlement and compensation in future projects. Resettlement and compensation need to be linked to the related government programs, particularly provision of affordable housing for illegal settlers along the waterways.

51. **Sustainability of community-based interventions.** Infrastructures built under the community-based water supply and sanitation component were handed over to the communities, which established O&M working groups. These mechanisms worked well and were successfully replicated independently. Solid-waste recycling facilities, which require more maintenance cost and more technical skills to operate, should be handed over to the districts, which would be able to allocate their annual budget for major maintenance. For the grant component, replication of CVM pilots is critical for watershed management**.** The CVM builds on strengthening the communities around the conservation areas to improve their livelihood and to help protect the conservation areas. Sustainability and replication of those successful community-based activities need continuous involvement of local governments and those project components to be mainstreamed into the local government yearly development program.

52. **Adoption of technology has increased the project quality.** The use of technologies such as the Java Spatial Model, river basin water balance model, and flood hydrodynamic model greatly benefited the preparation of IWRM plans. The implementation of the river basin plan (road map, *Pola*, and *Rencana*) will need further integration with the regional development plan; the modeling and simulation tools could support this process.

B. Recommendations

53. **Implementation of the river basin plan should be continued.** The legalization of *Pola* and *Rencana* as planning documents by the MPWH should be used optimally as a basis for future integrated river basin management. The river basin council should continue to lead, coordinate, and monitor the implementation of the river basin plan. BAPPENAS also has a role in planning and securing funding. The government should independently finance the operation of the river basin council (*Tim Koordinasi Pengelolaan Sumber Daya Air*), established in 2013. Future IWRM investment in the CRB needs to work closely with the *Tim Koordinasi Pengelolaan Sumber Daya Air*).

54. **Management of the WTC right-of-way (ROW) is both technically and socially important.** To ease O&M and to ensure that the WTC functions at full capacity, PJTII must implement the ROW management plan, including establishing law enforcement measures in coordination with the local government. Roles and responsibilities should be formalized through a legal agreement (starting with a memorandum of understanding) among agencies involved in ROW of WTC.

55. **Timing of the project performance evaluation report should be after full utilization of the WTC capacity.** The construction of additional water treatment plan will ensure the full investment benefit are gained. At the project completion the remaining WTC section to deliver additional water supply to Jakarta (5 m^3/sec) has been rehabilitated using the government fund. Additional water treatment plan as part of Jatiluhur regional water supply scheme are planned to be constructed in 2 phases, with 5 m^3/sec for each phase.

DESIGN AND MONITORING FRAMEWORK

Investment Program Design and Monitoring Framework

Design Summary	Performance Indicators and Targets	Project Achievement
Impact Reduced poverty and improved health and living standards in the CRB	Achieve a 5 percentage point decrease in poverty in the basin's communities currently below the national poverty average by the end of the investment program in 2023[b]	Partially achieved in PFR1.
Outcome Improved IWRM in the CRB	• Appropriate and effective institutional IWRM arrangements in basin (minimum scorecard level 3, 2015)[c] • Effective partnerships between national and local government agencies to implement water and land management activities (effective RCMU, 2010) • Empowered communities play a role in the management of water and land resources (2012 self-assessed) • Infrastructure in place to provide equitable access to adequate quantity and good water quality by all authorized water users (minimum scorecard level 3, 2023) • Comprehensive and accessible databases and information systems in place (2012)	Partially achieved in PFR1. The basin council for CRB was established as an appropriate institutional IWRM arrangement. Partnership between national and local government agencies was started, included partnership with the empowered communities. Water resources infrastructure (West Tarum Canal) was rehabilitated to its original design to provide adequate quantity for water users in capital city. Database and information systems was established.
Outputs **1. Institutions and Planning for IWRM** Good IWRM institutions and effective planning with stakeholder participation	• Implementing agencies and other relevant stakeholders are well informed about road map program progress (effective RCMU and PMU, 2009) • Operationalized and effective multi-stakeholder Water Council (2011) • Strategic Planning Framework for the 6 Ci's (*Pola*), ratified by 2012 and 6 Ci's Water Resources Management Plan (*Rencana*) by 2013 • All monitoring and reporting undertaken in accordance with agreed procedures, and full implementation of road map performance management system (RPMS) and Investment Program Performance Management System (IPPMS) by 2009	Partially achieved in PFR1. The basin council for CRB was established, and Pola and Rencana was approved by the Ministry of Public Works.
2. Water Resource Development and Management Effective planning, implementation, and operation and maintenance of water resource infrastructure	• Improved sources of water consistent with water availability and sustainability (program implemented in line with road map) • All people in the basin have access to adequate water supply and sanitation by 2023. • All rehabilitated water supply infrastructure capable of operating at design capacity 2 years after rehabilitation.	Partially achieved in PFR1. Water resources infrastructure (West Tarum Canal) was rehabilitated to its original design to provide adequate quantity for water users in capital city. Community based water supply and sanitation infrastructures was built for 15 villages downstream the canal and 10 villages in the river upstream.
3. Water Sharing Established and protected water rights and water allocated among competing uses and users, as well	• By 2012, an equitable water-sharing arrangement endorsed by Water Council for upper and lower basin and transboundary water resources	Not yet achieved in PFR1. The basin council for CRB has not been fully functioning.

Design Summary	Performance Indicators and Targets	Project Achievement
as priorities set for water entitlement during shortages	• Clearly defined water utilization rights for all authorized water users by 2012 • Conflicts over utilization of water resources resolved quickly and satisfactorily by 2015	
4. Environmental Protection Environmental protection and environmental enhancement by a combination of structural and other measures	• Comprehensive land-use plans in place and adhered to by 2012 • Minimal pollution from domestic, industrial, or agricultural sources entering the waterways of the basin (minimal score card level 2 by 2023) • Maintain and, if possible, enhance biodiversity; no further degradation by 2012	Not yet achieved in PFR1. The subcomponent under the Ministry of Environment and Forestry need to be scaled up with a policy reform.
5. Disaster Management Improved structural and other measures for flood and drought disaster management	• Appropriate infrastructure works and disaster preparedness plans in place to minimize the physical impacts of floods and mud flows by 2023 • Effective drought management plans in place by 2012 where available water falls seasonally below design expectations • Climate-proof the road map by 2012	Not yet achieved in PFR1. The flood disaster structural measures in upper Citarum basin is being constructed by the government and other development partner.
6. Community Empowerment Empowered communities and individuals actively participate in water management issues	• High awareness in basin communities about conservation, utilization, and protection of natural resources, including their rights and responsibilities, by 2014 • CRB NGOs and local communities have the opportunities and forums to participate meaningfully in the planning and management of water resources by 2012 • Enabling institutional, financial, and capacity conditions for local community involvement in provision of local water supply and sanitation services, watershed improvements, and waste management by 2023	Partially achieved in PFR1. BAPPENAS, MOA, MOEFr, MOH started the community based project components under PFR1.
7. Data and Information Effective data collection and storage and decision-support systems for water resources management	• MIS for land and water resources in place by 2012 • Effective arrangements for (i) custodianship of the different water- and catchment-related datasets, and (ii) data sharing by 2012 • Suitable models and decision-support tools operational by 2012	Partially achieved in PFR1. Database and information systems was established in PFR1.
8. Project Management Effective program management with timely monitoring and evaluation	• Timely procurement of consultants and contractors (no delays of more than 3 months) • Routine quarterly reports prepared and disseminated widely (web availability within 2 months of quarter end) • Wide stakeholder involvement in project activities (min scorecard level 3, 2012)	Partially achieved in PFR1. PFR 1 completed with 23 months loan extension.

ACTIVITIES **A. Investment Program (excluding Project 1 and TA funding)** **Output 1: Institutions and Planning for IWRM** Road map management (continuous) Development of an enhanced CRB plan for IWRM (P3, 2018) Support for basin Water Council and IWRM **Output 2: Water Resource Development and Management** Upgrading Bandung water source (P2, 2016) Upgrading of water source for irrigating upper Cipunegara (P3, 2020) Cisangkuy irrigation improvement (P4, 2023) Curug run-of-river power plant (P3, 2020) Mini- and micro-hydro basin study (P3, 2019) Heightening of Cirata Dam (P4, 2022) Bulk water supply options for Bekasi and Karawang (P4, 2023) Development of strategies and options for demand management and water conservation with respect to industrial and domestic use (P2, 2013) Urban water supply and sanitation options and implementation in urban areas (P4, 2023) **Output 3: Water Sharing** Review of allocation priorities and optimization in key sub-basins (P2, 2012) Implementation of surface water entitlements and licensing systems (P2, 2016) Implementation of water pricing and allocation strategies (P2, 2016) **Output 4: Environmental Protection** Water quality improvement in the three CRB reservoirs (P3, 2017) Wastewater and sewerage treatment upstream of Saguling Dam (P3, 2017) Development and implementation of integrated coastal zone management strategy and action plan for Citarum coastline (P3, 2020) Productive reforestation (P2, 2016) Protected area management (continuous) **Output 5: Disaster Management** Upper CRB flood management (P2, 2015) Integrated management of water-related disasters (P2, 2016) **Output 6: Community Empowerment** Community participatory activities (continuous) Information, education, and awareness strategy for capacity building of communities across the basin for improved participation in water resource policy development, planning, and management (P2, 2014) **Output 7: Data, Information, and Decision Support** Development of online flow-forecasting systems (P4, 2023) **Output 8: Program Management** Program management (continuous) Independent monitoring and evaluation (continuous) Program completion report (P4, 2023)	• Consultant services for project preparation, road map and program management, detailed engineering design (DED) and construction supervision, financial management, fiduciary oversight, and ADB policies and procedures • Civil works and equipment for water resource improvements, flood and drought prevention, and environmental enhancements • Training, demonstrations, and community development • Capacity building of 6 Ci's water management organizations and other implementing agencies
B. Project 1 Loan effective (January 2009) RCMU and PMU established (Q2 2008), PIUs established (Q1 2009) Recruitment of main design and program management consultants (Q2 2009) Establishment of Water Council (by end of 2011) Confirm strategic water resources management plan (*Pola*) for 6 Ci's (2012) First state-of-basin report end 2009, followed by routine annual reports Confirm basin water resources management plan (*Rencana*) for 6 Ci's (2013)	• ADB: $470 million OCR loan • ADB $30 million ADF loan • Government $382 million • GEF $3.75 million • Beneficiaries $21 million equivalent • ADB-administered TA supporting Project 1, $10.7 million for Project 1 only • Parallel TA funding $4.0 million

Rehabilitation of West Tarum Canal (2013) Improved land and water management (2012) Support for community- and NGO-driven initiatives for improved water supply and sanitation (2012) Development and implementation of basin river quality improvement strategy and action plans (2012) Watershed management and biodiversity conservation (GEF funded, 2012) Tranche PFR 2 released in timely manner (2012)	

ADB = Asian Development Bank, ADF = Asian Development Fund, CRB = Citarum River Basin, CSO = civil society organization, DSS = decision support systems, GEF = global environment facility, IPPMS = investment program performance monitoring system, IWRM = integrated water resources management, MIS = management information systems, NGO = nongovernment organization, O&M = operation and maintenance, OCR = ordinary capital resources, P = project, PFR = periodic financing request, PIU = project implementation unit, PMU = program management unit, Q = quarter, RCMU = road map coordination and management unit, RPMS = road map performance monitoring system, TA = technical assistance, WFPF = Multidonor Trust Fund under the Water Financing Partnership Facility.

[a] The design and monitoring framework for Project 1 is detailed in PFR1, with another related design and monitoring framework available for the TA in Supplementary Appendix F.

[b] Pre-project benchmarks refer to Bureau of Statistics village potential survey reports, documenting poverty and infrastructure in individual villages.

[c] The balanced scorecard system has been introduced in the CRB for benchmarking management and river performance and will be further refined and adopted for use in annual state-of-the-basin reporting. Scores will be allocated annually to agreed key performance categories following definitions and procedures adopted from the guidelines, now under development, of the Network of Asian River Basin Organizations. Score 1 = unacceptable, 2 = poor, 3 = good, and 4 = excellent.

PFR 1 Design and Monitoring Framework

Design Summary	Performance Indicators and Targets	Project Achievement
Impact Improved and more integrated water resource management in place.	• To have appropriate and effective institutional arrangements in place for integrated water resource management in the basin (2013). • To have effective partnerships between government agencies at the national, provincial and district level in place to implement planned water and land management activities (2012). • To have comprehensive and accessible databases in place to provide decision-makers, water managers, and technical experts with the best information to undertake their responsibilities for water resource management (2011).	• River basin councils have been established in the three separate RBTs. • West Java provincial government started the Citarum restoration program in 2014. • Partly completed. A centralized database for water quantity and water quality has been created. Institutionalization will require further support.
Outcomes Improved reliability of water supply to Jakarta and irrigation areas supplied by WTC	• Bulk water supplied to Jakarta and WTC irrigation area at an agreed-upon rate (to be decided at beginning of design) (2013)	• Rehabilitation of WTC has been completed with a capacity of 31 m^3/s. Water supply to Jakarta was increased from 16m^3/s to 21m^3/s.
Improved water use efficiency and increased yields for rice irrigation in three districts in the CRB	• Water use for rice production in project areas reduced by 20% (2013) • Rice yields increased by 10% in project areas (2013)	• Work with SRI in 3,000 ha completed in 2011. SRI reduced water utilization for agriculture (38%, based on secondary data) and increased yields up to 36% through organic agriculture practices.
Significant increase in the number of community- and NGO-driven initiatives for improved water and catchment management in the CRB	• The number of successful community- and NGO-driven initiatives for improved water and catchment management increased to 50 new initiatives a year (2013).	• Achieved. BAPPENAS, MOH, MOA, and MOE supported more than 50 community and NGO-driven initiatives.
Improved water quality in the waterways and reservoirs of the CRB	• Average values for key water quality parameters (BOD and turbidity) at WTC Jakarta water supply intakes reduced to acceptable levels and at least 50% of present levels. No annual WTC closure due to turbidity surges (2013)	• Partially achieved. Bekasi syphon construction to improve the quality at WTC Jakarta water supply, as part of WTC rehabilitation, completed. MOEFr component did not implement the major physical works to improve water quality of CRB.
OUTPUTS **Part 1: Road Map Management**		
1. Stakeholder participation: roles in planning, investment, and implementation.	• CRB stakeholders mapping, including government agencies, CSOs, and private sector at national, provincial, and district level. Road map media communication plan • Work with PMU provincial agencies, review the inventory of the current large groundwater users in the CRB. Engage in dialogue for surface water replacement schemes.	• Partially achieved. Coordination among sectors still needs to be strengthened with higher executing agency's involvement.

Design Summary	Performance Indicators and Targets	Project Achievement
2. Road map Information system (Atlas)	• Spatial database for CRB road map planning and Integrated Citarum Water Resources • ICWRMIP implementation • Comprehensive and systematic atlas of existing conditions, development potential, and constraints of the CRB.	• The CRB road map was complemented with Atlas, Agenda, and Aturan Main (implementation rule of the game). The road map was handed over to the new CRB council in 2014.
3. Corporate development plan for CRB (Agenda)	• Integrated agenda of strategic investment packages, including cost estimates, financing plan, pre-feasibility analysis, preliminary strategic environmental impact assessments, and options for public and private partnerships • Prepare a plan defining synergies between communities, NGOs, and public-sector agencies in the CRB	
4. Coordination among relevant agencies (Aturan Main)	• Review provincial and district government project planning and funding mechanisms and prepare practical mechanisms for inter-departmental, cross-boundary, and intersectoral coordination, and multi-stakeholder participation in planning, investment, and implementation of the strategic agenda (Aturan Main or rules-of-the-game)	
5. Strategic investment program for IWRM (updated road map)	• Road map implementation guidelines and procedures manual • Annual work program for RCMU activities.	
6. Road map management: mobilization of multisource funding	• Identify and assist with the management of grant funding, e.g., CDM, CSR, bilateral and multilateral agency for assisting road map implementation	• Not achieved. There was no submission of the road map progress report to ADB.
	• Road map progress reports for submission to the government and ADB	• Completed. Roadmap was synchronized with Pola and Rencana.
	• Review of the road map priority activities in accordance with *Pola* and *Rencana* and the funding gaps and prioritize activities for MFF funding	• Provincial government funding was mobilized.
	• PPP initiatives development strategy for the CRB	• Partly achieved. PPP initiatives just started at the project completion.
Part 2(a): Rehabilitation of West Tarum Canal		
Detailed engineering design Construction contractors selected by tendering Construction of improvement works	• Detailed engineering design successfully completed, meeting required standards (2010). • Fair and equitable selection process and successful contractors selected on merit (2011). • West Tarum Canal restored to its agreed design capacity • Water quality improved through exclusion of inflows of polluted water from crossing stream through construction of siphons • Water control structures restored to full operational status	• Completed. Detailed engineering design completed in July 2011 • Completed for WTC Package 1 and 2. • WTC Rehabilitation Works has been completed. • Bekasi siphon has been completed. • WTC Rehabilitation Works has been complete

Design Summary	Performance Indicators and Targets	Project Achievement
	• Environmental impacts minimized, and in particular through proper disposal of dredged material.	• Completed, environmental monitoring was conducted regularly, including monitoring of disposal of dredged material in the designated place.
Associated activities	• Social disruption for those living along the canal minimized, and access to water supply and sanitation maintained and improved, if necessary (2013)	• MOH completed the works in 15 villages along the canal for water and sanitation facilities before the canal rehabilitation works.
	• Capacity of PJT II and its staff strengthened to a level where WTC can be effectively and efficiently maintained (2011)	• PJT II staff have been trained to operate the automated trash rack.
Project Management	• Project completed on time and on budget to the agreed standard of quality (2013)	• Completed with 23 months loan extension.
Part 2(b): Improved Land and Water Management		
Identification and appraisal of target areas	• Appropriate target irrigation areas of 3,000 ha identified according to demand-responsive criteria and appraised accurately (2009)	• Completed. SRI program completed for 3,000 ha. Additional scope of sustainable upstream agriculture practices was completed in 2016.
Capacity building	• Capacity of trainers and farmers to implement SRI raised to the appropriate level through effective training (2010)	• Completed training provided through NGO specialized in SRI and technical support provided by district agriculture field officers
Progressive implementation of SRI	• Program for progressive implementation adhered to (2011)	• Completed. Program completed according to government procedures.
	• Procurement and distribution of supplies undertake according to agreed timetable (2011)	• Completed. • Equipment handed over to farmers
Management, monitoring, and reporting	• Timely monitoring and reporting carried out.	• The SRI completion report was submitted in 2013
Part 2(c): Support for Community- and NGO-Driven Initiatives for Improved Water Supply and Sanitation		
Capacity building and planning	• Capacity of participating communities (and particularly the community implementation teams) enhanced to a level that enables effective development and implementation of WSS action plans (2011) • WSS action plans and detailed designs developed in participating communities that will lead to improved WSS (2010) • Appropriate financing mechanism that will enable participating communities to have access to sufficient funds for implementation of their action plans (2011)	• Supported by the community facilitators, community groups were established to operate and maintain the built facilities. After 2 years of operation, most of the water supply facilities have doubled or tripled the number of customers. Some solid waste recycling facilities needs support for operation and maintenance.
Implementation and ongoing support	• Action plans implemented successfully in all participating communities within agreed time and budget (2013)	• Completed for the first phase in 2012. Physical works were completed for the upscaling phase in 2013 in Citarum upstream. Higher target (25 villages) was achieved.

Design Summary	Performance Indicators and Targets	Project Achievement
Management, monitoring, and reporting	• Project completed on time and on budget to the agreed standard of quality (2013)	• Completed.
Part 2(d): Detailed Engineering Design for Upgrading of Bandung Water Source and Other Uses by Inter-Basin Transfer		
Detailed engineering design	• Detailed engineering design successfully completed, meeting required standards for preferred water supply option identified in the options study and feasibility study (2012)	• DED works was not delivered by the project due to limited time available until the loan closing date.
Construction contractors selected by tendering	• Fair and equitable selection process and successful contractors selected on merit (2011).	• To be funded by government funds.
Associated activities	• Social disruption for those living along the targeted areas minimized, and access to water supply and sanitation maintained and improved, if necessary (2013) • Environmental impacts minimized through proper disposal of dredged material (2012) • Development of an inter-district agreement regarding cost allocation and ongoing financial arrangements for diverted water (2012)	• Not achieved. • Not achieved.
Project management	• Project completed on time and on budget to the agreed standard of quality (2013)	• Not achieved.
Part 3(a): Development and Implementation of a Basin River Quality Improvement Strategy and Action Plans		
Capacity building and planning	• Environmental agencies at all levels, universities, and research organizations have the capacity to undertake water quality management activities within their mandate (2012) • Community awareness and understanding of water quality issues, and how they can contribute to improved water quality, is raised (2010) • Multi-agency/stakeholder planning and coordination system for water quality management in place under the Water Council (2011)	• Partly achieved. Not all stakeholders can be reached by MOE • Completed. Pilot activities were implemented to raise awareness. • Partly achieved. New water council was re established in 2014, including for water quality management.
RWQIS and action plans	• Basin-wide RWQIS developed, promulgated, and effectively implemented through action plans (2011) • Water quality management action plans—combining cooperation, regulatory and incentive instruments—in place and being implemented effectively (2011)	• Partly achieved, need data sharing agreement to be effectively implemented. • Partly completed, loan allocation for physical implementationwas not used, instead only pilot activities implemented.
Policy development	• Key new policies and procedures for water quality management in place and being implemented effectively (2011)	• Not achieved. No key new regulation or procedures was developed and effectively implemented.
Data management	• A water quality and pollution source database management system in place and being effectively operated and maintained (2012)	• Partly completed. Implementation need data sharing agreement and regulatory framework.

Design Summary	Performance Indicators and Targets	Project Achievement
	• Improved water quality monitoring system in place and being effectively operated and maintained (2010)	• Partly completed. Implementation need data sharing agreement and regulatory framework.
Part 3(b): Citarum River Basin Catchment Management and Biodiversity Conservation		
1. Biodiversity mainstreamed in IWRM initiatives through: (i) effective coordination mechanism for CA management in the CRB; (ii) piggybacking biodiversity mainstreaming onto broader ICWRMIP project activities; and (iii) liaison with relevant agencies, including WRB, BBWSC	• Biodiversity conservation and CA management are included on committees for integrated watershed planning functions (2014)	• Completed. No committees established but biodiversity conservation and CA management are included in basin plan.
2. Biodiversity resources and habitat within CAs accurately understood and delineated.	• Permanent biodiversity monitoring stations established in eight CAs (2014).	• Achieved. Permanent biodiversity monitoring stations established in eight CAs.
3. Skills and knowledge of CA staff measurably strengthened Management planning for CAs improved.	• Approx. four training seminars conducted for a total of about 24 CA staff, including CA managers (2014)	• Achieved. Training seminars was conducted.
4. Degraded lands within and outside CAs rehabilitated, contributing to establishment and increased area of contiguous biodiversity corridors.	• Biodiversity management action plans prepared for eight CAs through participatory process; plans will include guidance for regular biodiversity surveys and monitoring, boundary marking, awareness raising, and staff training (2014) • Approx. 75 ha of degraded land within CAs rehabilitated within the term of the project (by 2014). • Approx. 40,160 ha (of total 54, 635 ha) of land within CAs brought under more effective management by end of project (2014) • Approx. 34 ha of degraded land outside CAs rehabilitated within the term of the project (2014) • executed MOAs, and operational by end of project (2014)	• Achieved. Biodiversity management action plans prepared for eight CAs through participatory process. • Achieved. Approx. 75 ha of degarded land within CAs was rehabilitated. • Achieved. Approx. 40,160 ha of land within CAs brought under more effective management
5. Funding gap for CA management reduced through PES.	• At least two PES schemes for sustainable financing put in place with	• Achieved. Two PES schemes were established.
6. Model conservation villages established	• At least three different alternative livelihood projects piloted in each of eight model conservation villages (total 24 pilots) (2014).	• Achieved. Three different alternative livelihood projects piloted in each of eight model conservation villages.
7. Sustainable alternative livelihoods supported	• A total of 17 villages (interlinked with Component 4) selected communities within CAs (5 villages around Gede Pangrango National Park, and 12 villages around CAs at BKSDA), and eight targeted model conservation villages in 17 communities adjacent to CAs are mobilized (with NGO facilitation), organized, and effectively contribute to management of local biodiversity resources (2014).	• Achieved. 17 villages within CAs and eight targeted model conservation villages in 17 communities adjacent to CAs are mobilized (with NGO facilitation), organized, and effectively contribute to management of local biodiversity resource

Design Summary	Performance Indicators and Targets	Project Achievement
8. Local communities empowered in planning and management of biodiversity and CAs.	• Interlinked GIS database system designed, installed and operational within eight CAs to support biodiversity monitoring and management (2014).	• Achieved. GIS database system designed, installed and operational within eight CAs to support biodiversity monitoring and management.
9. Scientific data employed effectively in biodiversity and CA management	• Biodiversity elements of project are effectively monitored through tracking tools and other targeted monitoring mechanisms (2014)	• Completed. Tracking tools were used for monitoring of biodiversity.
Part 4(a): Program Management (by the Program Management Unit)		
Coordination and planning	• Projects well-coordinated, with opportunities for information exchange maximized, and conflicts among projects minimized (2010)	• Achieved. Quarterly coordination meetings were implemented.
Monitoring and reporting of project performance, including financial management	• All monitoring and reporting undertaken in accordance with agreed procedures (2009)	• Partly completed, the investment monitoring report was not submitted
Coordination of preparation for Project 2	• Procedures for preparation of PFR for Project 2 followed and documentation prepared in accordance with ADB standards (2012)	• Partly achieved as the PMU involved in PPTA of PFR 2.
Social and environment safeguards oversight	• Social disruption for those living in project areas minimized (2013)	• Achieved. No social disruptions for those living in project areas.
	• Environmental impacts minimized through proper disposal of dredged material (2013)	• Achieved. Semi-annual environmental monitoring reports were submitted for WTC subcomponent. Dredged materials was disposed in the designated areas.
Part 4(b): Independent Monitoring and Evaluation		
A road map performance management system for the overall road map investments	• Road map performance management system designed and implemented by end of month 6	• Achieved, but by the end of month 18.
Quarterly progress reports, giving physical and financial progress, summary of field visits, consultant's staffing and administration details, issues of TA and project implementation requiring immediate resolution	• Quarterly progress reports submitted on time and to required standard	• Partially achieved. Progress reports were submitted but not on quarterly basis.
Semiannual consolidated project report. This report will summarize: (i) the RPMS progress; (ii) field and program issues requiring resolution; (iii) detailed team work program for the next half year	• Semiannual consolidated project reports submitted on time and to required standard	• Achieved. Reports were submitted.
A midterm review report that would summarize achievements, unresolved issues, and possibly a revised work program	• Midterm review report submitted by the end of month 30 and to required standard	• Achieved. Report was submitted.
Completion report	• Completion report submitted 2 months prior to project closure and to required standard	• Achieved. Completion report submitted at the end of project.

PROJECT COST AT APPRAISAL AND ACTUAL (PFR1)

($ million)

Item	Appraisal Estimate	Actual[a]
A. Land Acquisition and Resettlement	0.93	0.74
B. Civil Works	47.63	31.18
C. Consulting Services	23.31	25.40
D. Survey, Investigation and Design	0.59	0.73
E. Equipment	1.83	1.16
F. Training and Demonstration	2.80	2.69
G. Socialization and Community Development	3.90	0.63
H. Project Coordination and Management	0.87	0.33
I. Project Administration Support	4.73	0.01
J. Beneficiaries Contribution	2.83	-
Total Investment Costs	**89.43**	**62.85**
Contingencies	11.20	-
Interest During Implementation	2.63	0.78
Commitment Charges	0.12	0.18
Total	**103.40**	**63.83**

[a] May 2017

Source: Asian Development Bank.

PROJECT COST BY FINANCIER
($ million)

Table A3.1: Project Cost at Appraisal by Financier (PFR1)

Item		ADB TA		ADB (OCR+COL)		Government		GEF		Parallel Funding		Beneficiaries		Total
		Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	
A.	Land Acquisition and Resettlement	-	-	-	-	1.14	100.00%	-	-	-	-	-	-	1.14
B.	Civil Works	-	-	35.61	67.40%	17.20	32.57%	-	-	-	-	-	-	52.80
C.	Consulting Services	7.62	28.51%	8.82	33.00%	4.47	16.72%	1.74	6.51%	4.08	15.26%	-	-	26.72
D.	Survey, Investigation and Design	-	-	0.47	71.21%	0.19	28.79%	-	-	-	-	-	-	0.66
E.	Equipment	0.03	1.44%	0.70	33.65%	1.29	62.02%	0.06	2.88%	-	-	-	-	2.08
F.	Training and Demonstration	-	-	2.22	69.81%	0.73	22.96%	0.23	7.23%	-	-	-	-	3.18
G.	Socialization and Community Development	0.03	0.65%	1.78	38.70%	1.02	22.17%	1.77	38.48%	-	-	-	-	4.59
H.	Project Coordination and Management	0.33	33.00%	0.40	40.00%	0.27	27.00%	-	-	-	-	-	-	0.99
I.	Project Administration Support	-	-	-	-	5.34	100.00%	-	-	-	-	-	-	5.34
J.	Beneficiaries Contribution	-	-	-	-	-	-	-	-	-	-	3.14	100.00%	3.14
	Total	**8.00**	**7.96%**	**50.00**	**49.66%**	**31.65**	**31.44%**	**3.80**	**3.77%**	**4.08**	**4.05%**	**3.14**	**3.12%**	**100.65**
	Interest During Implementation	-	-	-	-	2.63	100.00%	-	-	-	-	-	-	2.63
	Commitment Charge	-	-	-	-	0.12	100.00%	-	-	-	-	-	-	0.12
	Total Project Cost	**8.00**	**7.74%**	**50.00**	**48.34%**	**34.40**	**33.26%**	**3.80**	**3.67%**	**4.08**	**3.94%**	**3.14**	**3.04%**	**103.43**
	% Total Project Cost		**8%**		**48%**		**33%**		**4%**		**4%**		**3%**	**100%**

Source: Asian Development Bank

Table A3.2: Project Cost at Appraisal by Financier (MFF)

Item		ADB TA Amount	ADB TA % of Cost Category	ADB (OCR+COL) Amount	ADB (OCR+COL) % of Cost Category	Government Amount	Government % of Cost Category	GEF Amount	GEF % of Cost Category	Parallel Funding Amount	Parallel Funding % of Cost Category	Beneficiaries Amount	Beneficiaries % of Cost Category	Total
A.	Institutions and Planning for IWRM	4.50	45.64%	3.00	30.43%	2.36	23.98%	-	-	-	-	-	-	9.86
B.	Water Resources Development and Management	1.00	0.18%	266.12	46.61%	298.65	52.31%	-	-	4.08	0.71%	1.04	0.18%	570.89
C.	Water Sharing	3.70	3.93%	73.00	77.31%	1.59	1.68%	-	-	-	-	16.13	17.08%	94.42
D.	Environmental Protection	1.00	1.00%	71.17	70.86%	24.47	24.36%	3.80	3.78%	-	-	-	-	100.45
E.	Disaster Management	0.80	1.07%	51.61	69.25%	22.12	29.68%	-	-	-	-	-	-	74.53
F.	Community Empowerment	-	-	-	-	1.85	32.17%	-	-	-	-	3.90	67.83%	5.75
G.	Program Management	-	-	4.15	23.16%	13.77	76.84%	-	-	-	-	-	-	17.92
	Total	**11.00**	**1.26%**	**469.06**	**53.66%**	**364.81**	**41.75%**	**3.80**	**0.43%**	**4.08**	**0.47%**	**21.07**	**2.41%**	**873.82**
	Interest During Implementation	-	-	28.22	63.13%	16.48	36.87%	-	-	-	-	-	-	44.70
	Commitment Charge	-	-	2.63	92.28%	0.22	7.72%	-	-	-	-	-	-	2.85
	Total Project Cost	**11.00**	**1.19%**	**499.91**	**54.26%**	**381.51**	**41.41%**	**3.80**	**0.41%**	**4.08**	**0.44%**	**21.07**	**2.29%**	**921.37**
	% Total Project Cost		**1%**		**54%**		**41%**		**0.5%**		**0.5%**		**3%**	**100%**

Source: Asian Development Bank.

Table A3.3: Project Cost at Completion by Financier (MFF and PFR1)

Item		ADB TA Amount	ADB TA % of Cost Category	ADB (OCR+COL) Amount	ADB (OCR+COL) % of Cost Category	Government Amount	Government % of Cost Category	GEF Amount	GEF % of Cost Category	Parallel Funding Amount	Parallel Funding % of Cost Category	Beneficiaries Amount	Beneficiaries % of Cost Category	Total
A.	Land Acquisition and Resettlement	-	-	-	-	0.74	100.00%	-	-	-	-	-	-	0.74
B.	Civil Works	-	-	27.21	87.27%	3.97	12.73%	-	-	-	-	-	-	31.18
C.	Consulting Services	9.60	35.91%	12.20	45.64%	1.58	5.91%	2.00	7.48%	-	-	-	-	25.38
D.	Survey, Investigation and Design	0.70	95.89%	-	-	-	-	0.03	4.11%	-	-	-	-	0.73
E.	Equipment	0.06	2.88%	0.57	27.40%	0.09	4.33%	0.44	21.15%	-	-	-	-	1.16
F.	Training and Demonstration	0.45	16.73%	1.83	68.03%	0.23	8.55%	0.18	6.69%	-	-	-	-	2.69
G.	Socialization and Community Development	-	-	-	-	-	-	0.63	100.00%	-	-	-	-	0.63
H.	Project Coordination and Management	-	-	-	-	-	-	0.33	100.00%	-	-	-	-	0.33
I.	Project Administration Support	0.03	100.00%	-	-	-	-	-	-	-	-	-	-	0.03
J.	Beneficiaries Contribution	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	**10.84**	**17.24%**	**41.81**	**66.50%**	**6.61**	**10.51%**	**3.61**	**5.74%**	-	-	-	-	**62.87**
	Interest During Implementation	-	-	-	-	0.78	100.00%	-	-	-	-	-	-	0.78
	Commitment Charge	-	-	-	-	0.18	100.00%	-	-	-	-	-	-	0.18
	Total Project Cost	**10.84**	**16.98%**	**41.81**	**65.50%**	**7.57**	**11.86%**	**3.61**	**5.66%**	-	-	-	-	**63.83**
	% Total Project Cost	**-**	**17%**	**-**	**65%**	**-**	**12%**	**-**	**6%**	**-**	**-**	-	**-**	**100%**

Source: Asian Development Bank.

DISBURSEMENT OF ADB LOAN AND GRANT PROCEEDS

Table 4.1: Annual and Cumulative Disbursement of ADB Loan Proceeds[a]

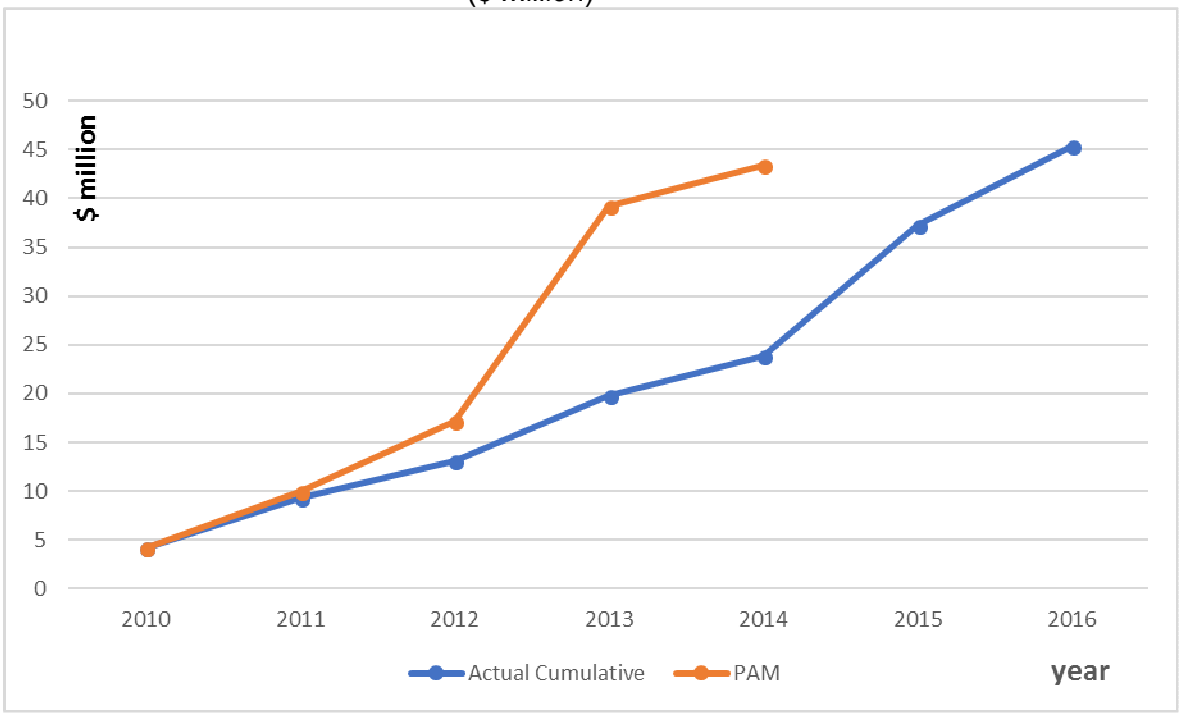
($ million)

	Annual Disbursement		Cumulative Disbursement	
Year[b]	Amount ($ million)	% of Total	Amount ($ million)	% of Total
2010	4.20	9.25%	4.20	9.25%
2011	5.13	11.28%	9.33	20.54%
2012	3.78	8.33%	13.11	28.87%
2013	6.72	14.79%	19.83	43.66%
2014	4.05	8.91%	23.88	52.57%
2015	13.37	29.43%	37.25	82.00%
2016	8.18	18.00%	45.43	100.00%
Total	**45.43**	**100.0%**		

[a] Includes disbursements to advance accounts.
[b] Classified by contract signing dates.
ADB = Asian Development Bank.
Source: Asian Development Bank.

Figure 4.1: Projection and Cumulative Disbursement of ADB Loan Proceeds

($ million)



Source: Asian Development Bank.

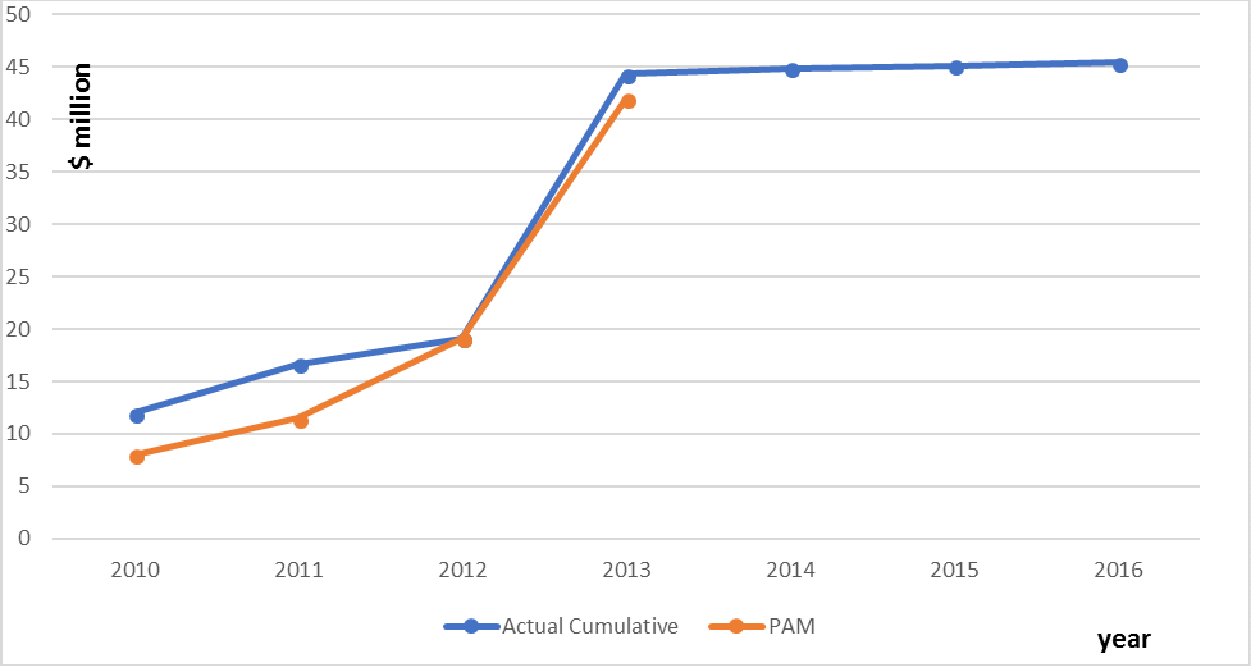
CONTRACT AWARDS OF ADB LOAN AND GRANT PROCEEDS

Table 5.1: Annual and Cumulative Contract Awards of ADB Loan Proceeds
($ million)

	Annual Contract Awards		Cumulative Contract Awards	
Year[a]	Amount ($ million)	% of Total	Amount ($ million)	% of Total
2010	11.96	26.32%	11.96	26.32%
2011	4.71	10.36%	16.66	36.68%
2012	2.45	5.40%	19.12	42.08%
2013	25.25	55.58%	44.37	97.66%
2014	0.53	1.17%	44.90	98.84%
2015	0.25	0.55%	45.15	99.38%
2016	0.28	0.62%	45.43	100.00%
Total	**45.43**	**100.0%**		

ADB = Asian Development Bank.
Source: Asian Development Bank.

Figure 5.1: Projection and Cumulative Contract Awards of ADB Loan Proceeds
($ million)



Source: Asian Development Bank.

CHRONOLOGY OF MAIN EVENTS

Date	Event
2009	
11–27 February 2009	Project inception mission
22 April 2009	Loan signing
3 June 2009	Loan effectiveness
4 June 2009	Loan allocation minor changes effectiveness
2010	
7–9 January 2010	Office of Special Project Facilitator (OSPF) mission and NGO complaint on the eviction in project area declared ineligible
12 April 2010	Letter on Agreement with Ministry of Environment for TA 7189-INO Climate Change component (TA major change in scope and increase of TA amount)
6–16 April 2010	Project consultation mission
26 April 2010	RSES memo on required actions in relation to force evictions in the project area
1 July 2010	Loan and TA delegation to IRM
2–9 August 2010	Special project Administration Mission
21 September–26 October 2010	Project Review Mission
12 November 2010	Grant effectiveness
2011	
3 February 2011	Complaint to OSPF declared eligible
2012	
1 March 2012	ADB Compliance Review Panel (CRP) received complaint on project resettlement, and declared it eligible
15 May 2012	President's approval on TA 7189-INO minor change of scope and increase of TA amount (The Government of Netherlands' fund)
14 November 2012	Grant delegation to IRM
2013	
10 April 2013	Board's Decision and CRP Final Report sent to Requesters and posted on website
7 October 2013	Issuance of West Java Governor Decree on the unit rate for compensation payment
9 December 2013	ADB approved the project updated resettlement plan and posted it on ADB website
2014	
May 2014	Rehabilitation of West Tarum Canal (WTC) commenced (partially)
18 June 2014	Approval of loan and grant extension until 31 May 2016
December 2014	Completion of compensation payment for WTC affected people
2015	
8 December 2015	CRP Final Monitoring Report issued
2016	
April 2016	Completion of WTC rehabilitation

Source: Asian Development Bank.

TECHNICAL ASSISTANCE COMPLETION REPORT

<table>
<tr><td colspan="3">TA Number, Country, and Name:
TA 7189-INO: Institutional Strengthening for Integrated Water Resources Management in the 6 Ci's River Basin Territory</td><td colspan="2">Amount Approved: $8,000,000.00
Revised Amount: $11,222,239.26</td></tr>
<tr><td>Executing Agencies:
Directorate General of Water Resources, Ministry of Public Works and Housing</td><td colspan="2">Source of Funding:
• Technical Assistance Special Fund (TASF): $1,000,00
• Multidonor trust fund under the Water Financing Partnership Facility: $2,000,000
• The Government of the Netherlands: $5,000,000
• ADB Climate Change Fund: $2,550,000</td><td>Amount Undisbursed:
$385,883.02</td><td>Amount Utilized:
$10,836,356.24</td></tr>
<tr><td>TA Approval Date:
4 December 2008</td><td>TA Signing Date:
28 January 2009</td><td>Fielding of First Consultants:
1 October 2009</td><td>TA Completion Date
Original:
31 December 2012</td><td>Actual:
30 September 2015</td></tr>
<tr><td colspan="3"></td><td>Account Closing Date
Original:
31 December 2012</td><td>Actual:
22 July 2016</td></tr>
</table>

Description. The Citarum, Ciliwung–Cisadane, and Ciujung–Cidanau–Cidurian River Basin Territory (RBT) is important for the future water supply of Jakarta and its satellite urban and industrial areas. The territory has a population of 35 million. It has been named the "6 Ci's River Basin Territory" (6 Ci's RBT). The Citarum River Basin (CRB) is the largest and most strategic of the rivers. The 6 Ci's RBT will be managed under a coordinated framework that recognizes both the role of water in fulfilling economic development targets in a sustainable manner, and the diverse individual characteristics and needs of each of the sub-basins. Since 2007 ADB had initiated some work for institutional strengthening for water resource management in the Citarum, Ciliwung–Cisadane, and Ciujung–Cidanau–Cidurian RBT. Subsequent to developing the road map for integrated water resources management (IWRM) in the CRB, the government requested ADB support to ensure that the institutions for water resource management can sustainably implement and maintained the investment under the roadmap. ADB approved the TA in late 2008, with funding from the government of the Netherlands, TASF, and from the Multidonor Trust Fund under the water financing partnership facility.[1] The TA was piggybacked to the multitranche financing facility for the Integrated Citarum Water Resources Management Investment Program (ICWRMIP) in Indonesia. The TA aimed to provide institutional support to the investment program and its first project IWRM activities in the CRB, and to support the planning and programming of the 6 Ci's RBT.

Expected Impact, Outcome, and Outputs. The expected impact was sustainable management of water resources for economic and social development in the 6 Ci's RBT. The expected outcomes were (i) improved capacity for IWRM in the 6 Ci's RBT in accordance with the 2004 Water Law, and (ii) effective and efficient implementation of the ICWRMIP. The TA had seven outputs: (i) improved mechanisms for national and regional IWRM planning, programming, and funding; (ii) a strategic river basin plan (*Pola*) and its associated investment and implementation plan (*Rencana*) for water resource development and management in the 6 Ci's RBT; (iii) the Java Spatial Model (JSM) for land use and water resources planning in the 6 Ci's RBT; (iv) groundwater management and water allocation strategies for the CRB; (v) a flood model and flood management strategy for the upper CRB; (vi) an integrated hydrological and water quality decision support system for the CRB; and (vii) a climate change mitigation and adaptation strategy with implementation of pilot projects for the CRB.

Delivery of Inputs and Conduct of Activities. On 29 July 2010, the ADB Board approved a major change in scope to increase the TA amount by $2.55 million to expand the scope on climate change adaptation and mitigation. The additional TA amount was financed by the ADB Climate Change Fund ($850,000 for mitigation and $1,700,000 for adaptation). The TA and loan (PFR1) administration was transferred to the Indonesia Resident Mission on 1 July 2010. On 15 May 2012, the President approved a minor change of TA scope and increase in the TA amount by $1 million, funded by the government of the Netherlands for additional technical capacity building and further analysis on two options of the upper Citarum flood management strategy. An estimated 124 person-months of international consultancy and 310 person-months of national consultancy was envisaged. The actual consultant inputs were 257 person-months (international) and 859 person-months (national). There were six consulting firms for each TA component and four international individual consultants. The TA components were implemented by BAPPENAS; Research Center for Water Resources, and the Directorate of Water Resources Management under Directorate General of Water Resources of the Ministry of Public Works; and the Ministry of Environment. The first consultant mobilization was on 1 October 2009 to support the TA outputs (i) and (v), followed by another consultant mobilization (8 November 2009) to support output (ii), (iii) and (iv). The Korean Water Resources Corporation (K-Water), under a memorandum of understanding with ADB, started in August 2010 to support output (vi). The last climate change adaptation and mitigation consultant was mobilized in December 2010 to support output (vii). The inception meetings were conducted for each of the TA components in 2009–2011. The TA was extended three times: (i) from 31 December 2012 to 30 September 2013, due to minor change in scope and additional funds approved on 12 May

[1] Financing Partners: Australia, Austria, Norway, Spain, and Switzerland.

2013; (ii) from 30 September 2013 to 30 September 2014 to allow the implementation of the pilot activities under the climate change mitigation and adaptation component; and (iii) from 30 September 2014 to 30 September 2015 to complete the ongoing pilot activities, additional capacity building activities for the project implementation units and the local communities, and to the prepare additional knowledge products. All of the TA components were completed during 2012 – 2013, except the climate change adaptation and mitigation component that was completed in 2015. The quality of inputs was adequate to achieve the intended outputs: (i) formulating reports, (ii) supporting and delivering capacity building for the river basin organization to develop the water resources management strategic plan and master plan for the 6 Ci's RBT (*Pola* and *Rencana*) using the JSM, (iii) developing the flood model and flood management strategy for the upper Citarum basin, (iv) initiating water resources data management and decision support system in the CRB, and (v) piloting and studying the climate-change mitigation and adaption in the CRB. The split of 6 Ci's into three separate river basin territories late in the TA implementation period (2012) increased the work duration, the experts' inputs, and the river basin planning document development (*Pola* and *Rencana)* under the output (ii). The river basin council had to be reestablished as well in each of the three river basin territories.

ADB reviewed the TA implementation as part of the loan and grant review missions. The implementing agencies (IAs) provided adequate support for the consultant and actively participated in TA review mission. The executing agency (EA) was satisfied with the TA input as it supported the implementation of ICWRMIP. ADB submitted a semiannual TA progress report through the Netherlands' embassy in Jakarta. The performance of ADB, the consultants, the EA, and the different IAs were *satisfactory*.

Evaluation of Outputs and Achievement of Outcome. The TA achieved the outcome of increased capacity of IWRM and partially achieved effective implementation of the investment. The outputs are successfully completed: Citarum roadmap institutional strengthening, institutional strengthening and spatial planning for IWRM in 6 Ci's RBT, development of key policies and strategies for water resources management, upper CRB flood management, decision support system development, and climate change adaptation and mitigation pilots in CRB. The TA has achieved all the major targets, and produced a knowledge product for river basin management planning in Indonesia.[2]

Overall Assessment and Rating. The overall assessment is successful. The TA was relevant as it supported the investment of IWRM implementation. The TA was effective as it delivered all the planned outputs and outcomes by conducting capacity building for basin planning as part of the institutional strengthening component, supporting the establishment of the basin councils and provincial working group for Citarum roadmap, piloting several climate-change adaptation and mitigation activities in the field, and disseminating TA outputs by publishing a book as ADB knowledge product. The TA was less than efficient because it required 33 months extension and had the undisbursed amount of $0.4 million out of $11.2 million of TA budget. The TA is likely to be sustainable becuase TA outputs and pilot projects were formally handed over to the Government to enable proper maintenance. The basin plan documents (*Pola Rencana*) is the basis for the river basin organization to develop their future plan and program as required by the water law.

Major Lessons. The implementation of the basin plan will need to be integrated in the regional development plan to ensure adequate budget and implementation of the physical and non-physical interventions in the basin plan. The TA demonstrated an integrated approach for water resources management in river basin planning by using several spatial planning tools, such as the JSM to improve the quality and process of the basin plan development.

Supporting the government in the formulation of a basin plan such as *Pola* and *Rencana* takes longer, since it not only needs TA from the consultant, but there are also several mandatory non-technical steps such as public consultation and endorsement of the river basin council. However, long-term technical input from the consultant teams helped the government to take consistent approach in basin plan development. It has also improved the quality of the basin planning development. As $385,883 was undisbursed/unutilized from savings in the pilot activities and contingencies under the climate change adaptation and mitigation, a better planning on the TA activities would allow for funding optimization.

Recommendations and Follow-Up Actions. ADB can help the government implement the basin plan (*Pola* and *Rencana*) in each river basin territory of the 6 Ci's after the Minister of Public Works and Housing legalizes the documents. A strong legal basis is needed for the decision support system for continuous implementation of an IWRM support system. Therefore, the development of a legal basis for a data sharing agreement among stakeholders is advised. The integration of IWRM planning and programming could be piloted in one river basin, if there is strong political will from the central and local governments.

TA = technical assistance.

Prepared by Helena Lawira Designation and Division: Project Officer (Water Sector), Indonesia Resident Mission

[2] ADB. 2016. *River Basin Planning in Indonesia: Policy and Practice*. Manila.

STATUS OF COMPLIANCE WITH FRAMEWORK FINANCING AGREEMENT, GRANT AND LOAN COVENANTS

Execution (1 of 1)

Loan Covenants/ Warrantees		Establishment of RCMU	Establishment of NSCWR	Policy guidance and direction related to the program and implementation of water resources development	Policy guidance and coordination assistance across govt. agencies and local governments	Road map and facility management operation	Stakeholder participation in IWRM using CDD approach and mainstreaming CSO involvement
Source		FFA, S3, P3	FFA, S3, P4	FFA, S3, P5 FFA, S6, P1	FFA, S3, P6	FFA, S3, P7	FFA, S3, P14
Implementing Agency	NSCWR/ RCMU/ BAPPENAS	Complied	Complied	Complied	Complied	Complied	Complied
	PMU	Not applied	Not applied	Not applied	Not applied	Complied	Complied
	PIU BBWSC	Not applied	Not applied	Not applied	Not applied	Not applied	Complied
	PIU BAPPENAS	Not applied	Not applied	Not applied	Not applied	Not applied	Complied
	MOA	Not applied	Not applied	Not applied	Not applied	Not applied	Complied
	MOE	Not applied	Not applied	Not applied	Not applied	Not applied	Complied
	MOFR	Not applied	Not applied	Not applied	Not applied	Not applied	Complied
	MOH	Not applied	Not applied	Not applied	Not applied	Not applied	Complied

Financial Aspects (1 of 1)

Loan Covenants/ Warrantees		Separate accounts and records for the project	Accounts and financial statements audited annually	Furnish ADB not later than 6 months after end of fiscal year with audited accounts, financial statements, and auditor's report	Counterpart funding available on timely basis	Starting 2010, and continue throughout the investment program, ensure adequate funds allocated in annual budget for O&M of all water resources assets included in investment program	Annually update the CRB road map implementation program to incorporate revised estimates of funding requirements
Source		FFA, S3, P8 LA,Art.4,Sect4.02(a)(i)	LA,Art.4,Sect4.02(a)(ii)	FFA, S3, P8 LA,Art4, Sect4.02(a)(iii)	FFA, S6, P5 LA, S5, P10	FFA, S6, P2; LA, S5, P11	FFA, S6, P5
Implementing Agency	RCMU/ BAPPENAS	Not applied	Not applied	Badan Pengawasan Keuangan dan Pembangunan (Financial and Development Supervisory Board) has furnished ADB the consolidated audited report for FY2016 on 31 Jan 2017 (Grant) and 22 June 2017 (Loan)	Not applied	Not applied	Partly complied. Requires long-term financing strategy
	PMU	Not applied	Not applied		Not applied	Not applied	Partly complied
	PIU BBWSC	Complied	Complied for FY2015, due for FY2016		Complied	Complied	-
	PIU BAPPENAS	Complied	Complied for FY2015, due for FY2016		Complied	Not applied	-
	MOA	Complied	Not applied due for FY2016		Complied	Complied	-
	MOE	Complied	Complied for FY2015, due for FY2016		Complied	Not applied	-
	MOFR	Complied	Complied for FY2015, due for FY2016		Complied	Not applied	-
	MOH	Complied	Not applied		Complied	Complied	-

Note: LA refers to Loan 2501-INO Agreement.

Implementation Arrangements (1 of 4)

Loan Covenants/ Warrantees		Responsible for overall management and coordination of project activities	Ensure overall planning and financial management at national and local government levels	Ensure PIU established w/in 30 days of effective date	Ensure stakeholder participation in project carried out through implementation of activities using community-driven approaches	Ensure that relevant provisions of ADB's anticorruption policy included in bidding documents; all contracts financed by ADB include provisions specifying right of ADB to audit and examine all accounts	Ensure that website is established for the project and updated regularly	Ensure that procurement committee is established [1/]	Undertake and make available to ADB annual inspection audits from independent auditor
Source		FFA, S3, P2 LA, S5, P2	FFA, S3, P2 LA, S5, P3	LA, S5, P7	LA, S5, P9	FFA, S6, P8 LA, S5, P12	FFA, S6, P9 LA, S5, P13	FFA, S6, P10 LA, S5, P14	LA, S5, P14
Implementing Agency	PMU/ BBWSC	Complied on coordination activities		Complied	Complied	Complied			Complied
	RCMU / BAPPENAS		Complied	Complied	Complied	Complied	Complied		Complied
	PIU BBWSC			Complied	Complied	Complied		Complied	Complied for AFS
	PIU BAPPENAS			Complied	Complied	Complied		Complied	Complied for AFS
	MOA			Complied	Complied	Complied		Complied	Complied for AFS
	MOE			Complied	Complied	Complied		Complied	Complied for AFS
	MOFR			Complied	Complied	Complied		Complied	Complied for AFS
	MOH			Complied	Complied	Complied		Complied	Complied for AFS

[1/] Procurement Committee shall be internally established by each PIU.
Note: LA refers to Loan 2501-INO Agreement.

Implementation Arrangements (2 of 4)

Loan Covenants/ Warrantees		PIU staff trained on procurement, financial management; financial controls established	Engage services of expert in fiduciary arrangements and technical quality assurance	Strict documentation by contractors on use of project funds for further releases	Ensure adherence to contractual obligations, Inspector Gen. of MPW build capacity of PMU	Road map performance monitoring system established w/in 6 months of effective date (3 Dec 09)	Investment program performance monitoring system established w/in 6 months of effective date (3 Dec 09)	Database of key benchmark indicators established w/in 9 months of effective date (3 Mar 09)	Project performance monitoring system established w/in 9 months of effective date (3 Mar 09)
Source		FFA, S6, P11 LA, S5, P15	FFA, S6, P11 LA, S5, P16	FFA, S6, P11 LA, S5, P17	FFA, S6, P11 LA, S5, P17	FFA, S3, P10 LA, S5, P18	FFA, S3, P10 LA, S5, P18	LA, S3, P12 FFA, S3, P10 LA, S5, P18	LA, S5, P19
Implementing Agency	PMU / BBWSC	Complied	Complied		Complied		Complied	Complied	Complied (PPMS for update)
	RCMU / BAPPENAS	Complied				Complied			
	PIU BBWSC	Complied		Complied					
	PIU BAPPENAS	Complied		Complied					
	MOA	Complied		Complied					
	MOE	Complied		Complied					
	MOFR	Complied		Complied					
	MOH	Complied		Complied					

Note: LA refers to Loan 2501-INO Agreement.

Implementation Arrangements (3 of 4)

Loan Covenants/ Warrantees		Undertake periodic performance review of project and investment program in accordance with IPPMS and PPMS	Consolidate annual PPMS reports prepared by IAs and submit consolidated IPPMS report to ADB	Submit quarterly progress reports and annual PPMS reports to PMU	Submit to ADB quarterly progress reports, semiannual consolidated progress reports	Initial 3 yrs of implementation, carry out jointly w/ADB semiannual reviews	3 yrs after effective date (Jun 2012) carry out jointly w/ADB comprehensive midterm review	TOR of midterm review developed jointly w/ADB; submit a detailed progress report	Ensure rehabilitation of WTC, implementation of EMP, incorporate EMP in bidding documents, BOQ, and contracts	Ensure project implemented in accordance to RP; RP disclosed; implementation of RP monitored
Source		LA, S5, P20	LA, S5, P20	LA, S5, P20, 21	FFA, S3, P8 LA, S5, P21	LA, S3, P13 LA, S5, P22	LA, S3, P13 LA, S5, P23	LA, S5, P23	LA, S5, P24	LA, S5, P25
Implementing Agency	PMU BBWSC / DGWR	Complied	Partly complied; PPMS update is included in PMU report		Complied	Complied	Complied; MTR fielded in July 2012	Complied	Complied	
	RCMU / BAPPENAS	Complied		Partly complied		Complied	Complied; MTR fielded in 2012			
	PIU BBWSC	Complied		Partly complied		Complied	Complied; MTR fielded in 2012		Complied	Complied
	PIU BAPPENAS	Complied		Partly complied		Complied	Complied; MTR fielded in 2012			
	MOA	Complied		Partly applied		Complied	Complied; MTR fielded in 2012			
	MOE	Complied		Partly complied		Complied	Complied; MTR fielded in 2012			
	MOFR	Not applied		Partly complied		Complied	Complied; MTR fielded in 2012			
	MOH	Complied		Partly complied		Complied	Complied; MTR fielded in 2012			

Note: LA refers to Loan 2501-INO Agreement.

Implementation Arrangements (4 of 4)

Loan Covenants/ Warrantees		Engage external agency or NGO acceptable to ADB to conduct external M&E of resettlement process and impacts; reports submitted to ADB on semiannual basis	Ensure that all work contracts include specific clauses on undertakings on social impacts	Ensure that reforms introduced to move from voluntary controls for polluters to a control system based on legal enforcement and financial incentives	Ensure road map vision used as a basis for development of *Pola* and *Rencana* for 6 Ci's River Basin Territory endorsed by 6 Ci's RBTWC (31 Dec 2012)	and formalized by ministerial decrees (31 Dec 2013)	Develop a framework for stakeholder discussions for establishing 6 Ci's River Basin Territory Organization and Water Council (no later than 30 Sep 09)	Issue the 1st annual "State of the Citarum River Basin" report (no later than Mar 2010)	Complete CRB institutional rationalizatio n reviews (no later than Jun 2010)
Source		LA, S3, P14 LA, S5, p26	FFA, S6, P12 LA, S5, P27	FFA, S6, P4 LA, S5, P29	FFA, S6, P6 LA, S5, P30	FFA, S6, P6 LA, S5, P30	FFA, S6, P7 LA, S5, P31	FFA, S6, P7 LA, S5, P31	FFA, S6, P7 LA, S5, P31
Implementing Agency	PMU BBWSC/ DGWR				Complied	Complied	6 Ci's has become 3 separate RBTs	Complied	Not applied because 6 Ci's has become 3 separate RBTs
	RCMU/ BAPPENAS		Complied		Complied				Not applied
	PIU/ BBWSC	Complied	Complied						
	MOA		Complied						
	MOE		Complied	Complied					
	MOFR		Complied						
	MOH		Complied						

Note: LA refers to Loan 2501-INO Agreement.

Loan Covenants/ Warrantees		Establish the 6 Ci's River Basin Territory Water Council (no later than Dec 2011)	Ensure that Bekasi to Cawang section of the WTC is rehabilitated or upgraded in line with ongoing French govt.-funded FASEP studies	If GEF grant cannot be made available, govt., in consultation w/ADB, undertakes to provide the funding from its own resources or reduce scope of project	Submit annual state of the basin report, which should include detailed progress of performance indicators and evaluations of realization of funding targets	Prepare consolidated annual work plans and budgets and submit to NSCWR for approval and forwarding to ADB	Submit project completion report to ADB w/in 3 mos. of completion of each investment program project loan	Monitor feasibility preparation and final design activities in accordance w/ program implementation schedule and keep ADB informed of significant deviations	Prepare and submit to ADB through NSCWR biannual road map progress reports	RPMS, where appropriate, will integrate MIS of regional govts. and CRB Water Council
Source		FFA, S.6, P7 LA, S5, P31	FFA, S6, P3 LA, S5, P32	LA, S5, P33	FFA, S6, P5	FFA, S3, P8	FFA, S3, P8	FFA, S3, P8	FFA, S3, P5 FFA, S3, P9	FFA, S3, P11
Implementing Agency	PMU BBWSC/ DGWR	Complied (Separated CRB Water Council)			Not complied	Complied	Complied	Complied		
	RCMU/ BAPPENAS					Complied		Complied	Partly complied, road map progress is presented on project website	Partly complied; the RPMS is available but doesn't integrate the MIS of regional govts. and CRB Water Council
	PIU/ BBWSC		Complied			Complied		Complied		
	PIU BAPPENAS					Complied				
	MOA					Complied	Complied			
	MOE					Complied				
	MOFR			GEF grant approved		Complied				
	MOH					Complied	Complied			

Note: LA refers to Loan 2501-INO Agreement.

Status of Compliance with Loan Covenants

Loan 2500/2501(SF)-INO: Integrated Citarum Water Resources Management Investment Program
Status of Loan Covenants as of 31 August 2016

Covenant	Reference in Loan Agreement	Status of Compliance
I. Particular Covenants		
The Borrower shall: (i) cause the Project to be carried out with due diligence and efficiency and in conformity with sound administrative, financial, engineering, environmental and water management practices. (ii) In the carrying out of the Project and operation of the Project facilities, the Borrower shall perform, or cause to be performed, all obligations set forth in Schedule 5 to the Special Operations Loan Agreement.	Loan Agreement (LA), L2500, Art. IV, Sect. 4.01	Complied
The Borrower shall make available, promptly as needed, the funds, facilities, services and other resources which are required, in addition to the proceeds of the Loan, for the carrying out of the Project and for the operation and maintenance of the Project facilities.	LA, L2500, Art. IV, Sect. 4.02.	Complied
In the carrying out of the Project, the Borrower shall: (i) cause competent and qualified contractors, acceptable to ADB, to be employed to an extent and upon terms and conditions satisfactory to the Borrower and ADB. (ii) cause the Project to be carried out in accordance with plans, design standards, specifications, work schedules and construction methods acceptable to ADB. The Borrower shall furnish, or cause to be furnished, to ADB, promptly after their preparation, such plans, design standards, specifications and work schedules, and any material modifications subsequently made therein, in such detail as ADB shall reasonably request.	LA, L2500, Art. IV, Sect. 4.03.	Complied
The Borrower shall ensure that the activities of its departments and agencies with respect to the carrying out of the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	LA, L2500, Art. IV, Sect. 4.04.	Complied

Covenant	Reference in Loan Agreement	Status of Compliance
The Borrower shall: (i) maintain, or cause to be maintained, separate accounts for the project. (ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB. (iii) furnish to ADB certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the loan proceeds and compliance with the financial covenants of the loan agreement as well as on the use of the procedures for imprest account and statement of expenditures, all in the English language. (iv) furnish to ADB such other information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.	LA, L2500, Art. IV, Sect. 4.05(a); L2501, Art. IV, Sect. 4.02(a).	Complied Complied Complied. Not later than 6 months after the end of each related fiscal year (June of the following year) No request.
The Borrower shall enable ADB, upon ADB's request, to discuss the Borrower's financial statements for the project and its financial affairs related to the project from time to time with the auditors appointed by the Borrower pursuant to L2500, Section 4.05(a)/L2501, Section 4.02(a) of Article IV, and shall authorize and require any representative of such auditors to participate in any such discussions requested by ADB, provided that any such discussion shall be conducted only in the presence of an authorized officer of the Borrower unless the Borrower shall otherwise agree.	LA, L2500, Art. IV, Sect, 4.05(b); L2501, Art. IV, Sect. 4.02(b).	Complied
The Borrower shall enable ADB's representatives to inspect the Project and the Works financed out of the proceeds of the Loan, and any relevant records and documents.	LA, L2500, Art. IV, Sect. 4.06.	No request.
The Borrower shall ensure that the Project facilities are operated, maintained and repaired in accordance with sound administrative, financial, engineering, environmental, water management and maintenance and operational practices.	LA, L2500, Art. IV, Sect. 4.07.	Complied
II. Implementation Arrangements **Executing Agency**		
Directorate General of Water Resources (DGWR) as the project executing agency shall be responsible for carrying out the project.	LA, L2501, Sched. 5, para.1.	Complied

Covenant	Reference in Loan Agreement	Status of Compliance
Project Coordination and Management Unit (PMU) PMU established by DGWR shall be responsible for overall management and coordination of the project activities. The PMU shall: (i) ensure that annual work plans are submitted by the PIUs in a timely manner and in a standard format. (ii) review and consolidate, for all PIUs, the annual work plans and corresponding budget estimates. (iii) prepare and submit reports to ADB and NSCWR. (iv) compile the results of project monitoring and evaluation and convey the consolidated results to the IAs and ADB. (v) liaise and coordinate with other donor agencies on complementary activities. (vi) organize coordination meetings and workshops, and issue invitations to the IAs at the national, provincial, and district levels as appropriate. (vii) arrange for representatives of the IAs to assist the ADB's review missions.	LA, L2501, Sched. 5, para.2.	Complied
Road Map Coordination and Management Unit (RCMU) RCMU established with BAPPENAS shall ensure overall planning and financial management at the national and local government levels. RCMU shall primarily: (i) review prioritization of activities under the Facility and other funding. (ii) facilitate consultations with stakeholders. (iii) liaise with bilateral and multilateral donors, and the private sector. (iv) monitor and evaluate the road map implementation performance. (v) work closely with NSCWR.	LA, L2501, Sched. 5, para.3.	Complied
National Steering Committee for Water Resources (NSCWR) NSCWR established within BAPPENAS shall be chaired by the Deputy of Infrastructure Affairs, BAPPENAS and comprises the following representatives: - Director General of Water Resources, MPW as Deputy Chairman; - Director Water Resources and Irrigation, State Ministry of National Development Planning/ National Development Planning Agency (BAPPENAS) as Secretary; - Director of Programming, DGWR, as Deputy Secretary;	LA, L2501, Sched. 5, para.4.	Complied, but need to be updated due to restructuring in the ministries in 2015

Covenant	Reference in Loan Agreement	Status of Compliance
- Director General of Land and Water Management, MOA; - Director General of Budget, Ministry of Finance (MOF); - Director General of Treasury, MOF; - Deputy of Water Resources Conservation and Environment Damage Control, State Ministry of Environment; - Deputy of Development Finance, State Ministry of National Development Planning/National Development Planning Agency (BAPPENAS); - Deputy of Natural Resources and Environment, State Ministry of National Development Planning/National Development Planning Agency (BAPPENAS); - Deputy of Decentralization Affair and Regional Development, State Ministry of National Development Planning/National Development Planning Agency (BAPPENAS).		
NSCWR shall provide: (i) policy guidance and direction related to the Investment Program and implementation of water resources development. (ii) guidance in overcoming obstacles and problems by giving directions and recommendations on the preparation and implementation of water resources development program financed by foreign loans and/or grants. (iii) policy guidance and coordination assistance across all central government agencies and local government agencies involved in integrated water resources management in the CRB and the road map implementation	LA, L2501, Sched. 5, para.5.	Complied
Implementation Agencies The IAs for the project will be: 1. Directorate of Water Resources and Irrigation, under the Deputy Minister of Infrastructure Affairs, BAPPENAS shall implement (i) part 1, support for institutions and planning for integrated water resources management; and (ii) part 4(b), independent monitoring and evaluation.	LA, L2501, Sched 5, para. 6.	(i) Complied (ii) Complied
2. CRBO (BBWSC), shall implement (i) part 2(a), rehabilitation of West Tarum Canal; (ii) part 2(d), detailed engineering design for upgrading of Bandung water resources; (iii) part 4(b), independent monitoring and evaluation.	LA, L2501, Sched 5, para. 6.	(i) Complied; (ii) Complied; (iii) Complied

Covenant	Reference in Loan Agreement	Status of Compliance
3. Directorate of Land Management, Directorate General of Land and Water Management, MOA shall implement part 2(b) improved on-farm land and water management practices.	LA, L2501, Sched 5, para. 6.	Complied
4. Directorate of Environmental Health, Directorate General of Disease Control and Environment Health, MOH shall implement part 3(a) development of a basin river quality improvement strategy and action plans.	LA, L2501, Sched 5, para. 6.	Complied
5. The unit under the Deputy Assistant of Lake and River Damage Control, State Ministry of the Environment, shall implement part 3(a) development of a basin river quality improvement strategy and action plans.	LA, L2501, Sched 5, para. 6.	Complied After restructuring of the ministry in 2015, it is handled by the Directorate of Terrestrial Water Damage Control, Directorate General of River Basin and Protected Forest Management, Ministry of Environment and Forestry
6. Directorate of Area Conservation, Directorate General of Forest Protection and Nature Conservation, Ministry of Forest, shall implement part 3(b) Citarum river basin catchment management and biodiversity conservation.	LA, L2501, Sched 5, para. 6.	Complied After restructuring of the ministry in 2015, it is handled by the Directorate of Essential Ecosystem Management, Directorate General of Natural Resources Management and Ecosystem Conservation, Ministry of Environment and Forestry
A PIU is established within each IA and maintained throughout the project implementation period.	LA, L2501, Sched. 5, para.7.	Complied, 3 July 2009
Borrower shall maintain (i) the RCMU within BAPPENAS to support the NSCWR, and (ii) the PMU in CRBO within DGWR with permanent staff representation from each relevant IA.	LA, L2501, Sched. 5, para.8.	(i) Complied (ii) Complied
Stakeholders' Participation		
Borrower shall ensure that stakeholder participation in the Project is carried out through implementation of activities using community-driven development approaches and, more importantly CSO involvement in CRB development and management strategy planning, monitoring and evaluation is mainstreamed.	LA, L2501, Sched. 5, para.9.	Complied

Covenant	Reference in Loan Agreement	Status of Compliance
In project design and implementation, Borrower shall support (i) a community-driven development approach, (ii) intensive media and campaigns, (iii) community and private sector behavior change activities, (iv) private sector involvement in integrated water resources management through corporate social responsibility programs, and (v) community empowerment initiatives, governance initiatives and stakeholder complaint mechanisms.		
III. Counterpart Funding		
Borrower shall ensure that necessary counterpart funds are made available and released on a timely basis to implement the project.	LA, L2501, Sched. 5, para. 10.	Complied
Borrower shall update the road map to incorporate revised estimates of the funding requirements for the project.		Complied annually
Borrower shall submit to ADB its annual State of the Basin report which shall include detailed progress of the road map performance and evaluations funding targets.		Not complied, the report was not submitted to ADB.
Borrower shall ensure that adequate funds are allocated in its annual budgets for the operations and maintenance of all water resources assets included in the project.	LA, L2501, Sched. 5, para. 11.	Complied, starting from 2010 and throughout project implementation
Borrower shall encourage and support contributions for asset management by the respective users.		Complied
IV. Governance and Anticorruption		
Borrower shall ensure that (i) relevant provisions of ADB's Anticorruption Policy (1998, as amended to date) are included in all bidding documents for the project; and (ii) all contracts financed by ADB in connection with the project include provisions specifying the right of ADB to audit and examine the records and accounts of DGWR, IAs, all contractors, suppliers, consultants and other service providers as they relate to the project.	LA, L2501, Sched. 5, para. 12.	Complied
Borrower shall ensure that DGWR establishes a website for the project and posts financial statements and tract procurement contract awards, including information on the list of participating bidders, name of the winning bidder, basic details on bidding procedures adopted, amount of the contract awarded, list of goods and/or services purchased, and their intended and actual utilization.	LA, L2501, Sched. 5, para. 13.	Partially complied. The website for the project has been established and administered by BAPPENAS. The information provided on that website (www.citarum.org)

Covenant	Reference in Loan Agreement	Status of Compliance
		should be completed to facilitate tracking of procurement contract award in accordance with the loan covenant requirements
Borrower shall ensure that each IA establishes a procurement committee consisting of representatives from the related departments and the PMU. DGWR and each IA shall undertake and make available to ADB the annual inspection audits from an independent auditor.	LA, L2501, Sched. 5, para. 14.	Complied
Borrower shall ensure that (i) PIU staff are trained on appropriate procurement and financial management procedures set forth in applicable provisions of the procurement, accounting and auditing rules and regulations of the Borrower and ADB; (ii) financial controls are established through periodic review, reconciliation and reporting of status of fund releases, disbursements and liquidation; and (iii) all community-based activities and goods procured for the community are communicated in advance on village notices and through facilitated dialogue with the respective community.	LA, L2501, Sched. 5, para. 15.	Complied
PMU shall engage the services of an expert in fiduciary arrangements and technical quality assurance who shall semi-annually, or as deemed necessary, review the project's physical progress and performance regarding the financial assurances.	LA, L2501, Sched. 5, para. 16.	Complied
Borrower shall require strict documentation by its contractors with respect to the use of project funds as basis for further releases. To ensure adherence to contractual obligations, the office of the Inspector General of MPW shall, through routing inputs, build capacity in the PMU to ensure implementation of sound quality control and quality assurance procedures for works and consulting services.	LA, L2501, Sched. 5, para. 17.	Complied
V. Performance Monitoring Systems and Reviews **Performance Monitoring Systems**		
BAPPENAS shall establish a RPMS in the RCMU and DGWR shall establish an IPPMS in the PMU acceptable to ADB	LA, L2501, Sched. 5, para. 18.	Complied within 6 months of the effective date (3 Dec 2009)
BAPPENAS and DGWR shall establish a database of key benchmark indicators.		Complied within 9 months of the effective date (3 Mar 2010)

Covenant	Reference in Loan Agreement	Status of Compliance
DGWR shall establish within the PMU a PPMS to monitor and evaluate the performance and development impact of the project in form and substance acceptable to ADB.	LA, L2501, Sched. 5, para. 19.	Complied within 9 months of the effective date (3 Mar 2010)
DGWR and each of the IAs shall undertake periodic performance review of the project and of the investment program in accordance with the IPPMS and the PPMS to evaluate the scope, implementation arrangements, progress and achievements of objectives of the project and overall investment program.	LA, L2501, Sched. 5, para. 20.	Complied
PMU shall consolidate annual PPMS reports prepared by PIUs of the IAs and submit the consolidated IPPMS report to ADB.		Partially complied. The PPMS report is included in the PMU progress report
PMU shall (i) submit to ADB the progress reports of each IA; and (ii) prepare and submit to ADB semi-annual consolidated progress reports for the project. The reports shall include: (i) a description of physical progress, (ii) problems encountered, (iii) a summary of financial accounts that shall consist of project expenditures during the period, year to day, and total to date, (iv) implementation progress of the EMP and measures taken under the IEE and environmental monitoring carried out as a regular part of project implementation, and (v) resettlement monitoring as detailed in the RP.	LA, L2501, Sched. 5, para. 21.	Complied.
Reviews		
Borrower shall carry out jointly with ADB semiannual reviews to (i) ensure that the implementation arrangements are appropriate; (ii) assess implementation performance and achievement of project outcomes and objectives against the agreed implementation schedule, identify bottlenecks, and agree time-bound action plan for their resolution; (iii) ensure that conditions regarding safeguards and other conditions are being met; (iv) assess progress made in mobilizing CSOs; and (v) assess the readiness for project 2 implementation.	LA, L2501, Sched. 5, para. 22.	Complied.
Borrower shall jointly with ADB undertake a comprehensive midterm review of the project, which shall assess performance, identify problems affecting project implementation, and reach formal agreement with ADB on changes on the scope or implementation arrangements of the project and investment program required to address these shortfalls.		Complied. MTR fielded in July 2012. TOR jointly formulated; DGWR's detailed progress report due 3 years after the effective date (3 June 2012)

Covenant	Reference in Loan Agreement	Status of Compliance
The terms of reference of the midterm review shall be developed jointly by DGWR and ADB. DGWR shall submit to ADB a detailed progress report.		
VI. Safeguards and Social Issues **Environment**		
DGWR shall ensure that: (i) the West Tarum Canal is rehabilitated and other facilities and structures under the project are designed, constructed, and operated in accordance with all applicable laws and regulations of the Borrower, ADB's Environment Policy (2002), and the IEE;	LA, L2501, Sched. 5, para. 24.	Complied
(ii) any adverse environmental impacts are minimized by implementing the mitigation measures and the monitoring program set out in the EMP;		Complied
(iii) implementation of the EMP and any violation of the environmental standards are reported to ADB in accordance with the IEE; and		Complied semiannually
(iv) EMP is incorporated in the bidding documents and bill of quantities; and made a part of the works contracts.		Complied
VII. Resettlement		
DGWR shall ensure that: (i) the project is implemented in accordance with applicable laws and regulations of the Borrower, ADB' Involuntary Resettlement Policy (1995), and the Resettlement Plan (RP);	LA, L2501, Sched 5, para. 25.	Complied
(ii) all affected people are given adequate opportunity to participate in resettlement planning and implementation;		Complied
(iii) the RP: (a) is disclosed to the affected people, who are compensated and assisted prior to displacement from their houses, land and assets, before commencement of civil works under the project; (b) is updated based on the detailed feasibility studies or detailed designs; (c) is submitted to ADB for approval and disclosure on its website; (d) includes complete information on full census, final asset inventory and valuation, and final budget, and (e) is approved by ADB prior to notice to proceed		Complied

Covenant	Reference in Loan Agreement	Status of Compliance
for works in the construction zone;		
(iv) implementation of the RP is monitored (a) internally by the PIUs and reported monthly to the PMU who shall report the results quarterly to ADB, and (b) independently by an external agency or a non-government organization, acceptable to ADB, and reported biannually directly to ADB;		Complied
(v) affected people have an opportunity to express grievance at appropriate levels; and		Complied
(vi) local officials are instructed to resolve disputes and implement measures promptly.		Complied
Borrower shall engage an external agency or a non-government organization, acceptable to ADB, to: (i) conduct external monitoring and evaluation of the resettlement process and impacts (ii) Reports of such external monitoring agency shall be submitted to ADB	LA, L2501, Sched. 5, para. 26.	(i) and (ii) Complied semiannually
Social Impacts		
Borrower shall ensure and cause all IAs to ensure that all works contractors are required to (i) comply with all applicable labor laws of the Borrower, (ii) use their best efforts to employ women and local people living in the vicinity of the project/subproject, (iii) disseminate information at worksites on the risks of sexually transmitted diseases and HIV/AIDs for those employed during construction, (iv) not differentiate between men's and women's wages or benefits for work of equal value, and (v) not use child labor. Such works contracts must include specific clauses on these undertakings.	LA, L2501, Sched. 5, para. 27.	Complied
Borrower shall ensure and cause all IAs to ensure, that compliance with these provisions is monitored by the respective PIUs.		Complied
Borrower shall ensure that project is implemented in accordance with ADB's Policy on Indigenous People (1998).	LA, L2501, Sched. 5, para. 28.	Not applied
VIII. Other Matter Borrower shall ensure that in line with the expected results of the proposed CRB pollution control action plan, reforms are introduced to move from voluntary controls for polluters to a control system based on legal enforcement and financial incentives	LA, L2501, Sched. 5, para. 29.	Not complied. Reforms was not introduced to move from voluntary controls for polluters to a control system.

Covenant	Reference in Loan Agreement	Status of Compliance
Borrower shall ensure that the Road Map Vision is used a s a basis for the development of a strategic planning framework for the 6 Ci's River Basin Territory Water Council and formalized by Ministerial Decrees	LA, L2501, Sched. 5, para. 30.	Complied by 31 December 2012 and 31 December 2013, respectively.
Future regional spatial planning and strategic development plans shall incorporate the goals for the strategic planning framework for the 6 Ci's River Basin Territory.		Complied, 6 Ci's RBT has been separated into 3 RBTs
Borrower shall have: (i) developed a framework for stakeholders discussions for establishing the 6 Ci's River Basin Territory organization and water council	LA, L2501, Sched. 5, para. 31.	6 Ci's RBT has been separated into 3 RBTs, therefore each RBT has established its river basin councils No later than 30 September 2009
(ii) issued the first annual "State of the Citarum River Basin" report,		Not complied. Report was not submitted to ADB.
(iii) completed CRB institutional rationalization reviews, including among others: matching the roles, responsibilities and resources of national and regional water resources management organizations (including PJT-2, CRBO, provincial and district agencies) to ensure rationalization of water resources and irrigation asset management and allocation of and management of needs based funding for the Tarum canal systems and the Jatiluhur irrigation systems, and		Complied. The 6 Ci's was split into 3 RBTs in 2012 and the water council for each RBT has been established
(iv) established the 6 Ci's River Basin Territory Water Council.		Complied No later than December 2011
LA, L2501, Sched. 5, para. 32. Borrower shall ensure that the Bekasi to Cawang section of the West Tarum Canal shall be either rehabilitated to adequate design capacity or upgraded in line with ongoing studies funded by the Government of France and detailed engineering design, in a timely manner to ensure availability of increased capacity coinciding with the commissioning of the West Tarum Canal Curug to Bekasi works funded under the project.		Complied. Bekasi to Cawang section began to be financed by government funds in 2016
LA, L2501, Sched. 5, para. 33. In the event the GEF grant cannot be made available for the Citarum river basin catchment management and biodiversity conservation (part 3(b) of the project), the Borrower shall, in consultation with ADB, undertake to either		GEF grant fund granted by the GEF council for $3.75 million in August 2010 for the Project.

Covenant	Reference in Loan Agreement	Status of Compliance
provide the corresponding funding from its own resources or agree to reduce the scope of the project accordingly.		

Grant 0216-INO: Citarum Watershed Management and Biodiversity Conservation
Status of Grant Covenants as of 31 August 2016

Covenant	Reference in Grant Agreement	Status of Compliance
I. Particular Covenants		
The Recipient shall: (i) maintain, or cause to be maintained, separate accounts for the project	Grant Agreement (GA), G0216, Art. IV, Sect. 4.02(a).	Complied
(ii) have such accounts and related financial statements audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB		Complied
(iii) furnish to ADB certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the loan proceeds and compliance with the financial covenants of the loan agreement as well as on the use of the procedures for imprest account and statement of expenditures, all in the English language		Complied. Not later than 6 months after the end of each related fiscal year (June of the following year)
(iv) furnish to ADB such other information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request		No request during project implementation.
The Recipient shall enable ADB, upon ADB's request, to discuss the Recipient's financial statements for the project and its financial affairs related to the project from time to time with the auditors appointed by the Borrower pursuant to G0216, Section 4.05(a)/L2501, Section 4.02(a) of Article IV, and shall authorize and require any representative of such auditors to participate in any such discussions requested by ADB, provided that any such discussion shall be conducted only in the presence of an authorized officer of the Recipient unless the Recipient shall otherwise agree.	GA, G0216, Art. IV, Sect, 4.02(b).	Complied
The Recipient shall take out and maintain with responsible insurers, or make other arrangements satisfactory to ADB for, insurance against such risks and in such amounts as shall be consistent with sound practice. The Recipient shall be deemed to have opted for self-insurance in the absence of any specific insurance for the Project.	GA, G0216, Art. IV, Sect, 4.05(a)	Complied

Covenant	Reference in Grant Agreement	Status of Compliance
Without limiting the generality of the foregoing, the Recipient undertakes to insure, or cause to be insured, the Goods to be imported for the Project and to be financed out of the proceeds of the GEF Grant against hazards incident to the acquisition, transportation and delivery thereof to the place of use or installation, and for such insurance any indemnity shall be payable in a currency freely usable to replace or repair such Goods.	GA, G0216, Art. IV, Sect, 4.05(b)	Complied
The Recipient shall furnish, or cause to be furnished, to ADB all such reports as ADB shall reasonably request concerning (i) the GEF Grant, and the expenditure of the proceeds and maintenance of the service thereof; (ii) the Goods and/or consulting services and other items of expenditure financed out of the proceeds of the GEF Grant; (iii) the Project and the Project Executing Agency; (iv) the administration and operations of the Recipient; and (v) any other matters relating to the purposes of the GEF Grant.	GA, G0216, Art. IV, Sect, 4.06(a)	Complied
Without limiting the generality of the foregoing, the Recipient shall furnish to ADB quarterly reports, or reports at such other later interval as maybe agreed for this purpose between ADB and the Recipient on the execution of the Project, on the accomplishment of the targets and actions agreed between ADB and the Recipient, and on the operation and management of the Project facilities. Such reports shall be submitted in such form and in such detail and within such a period as ADB shall reasonably request, and shall indicate, among other things, progress made and problems encountered during the quarter under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following quarter.	GA, G0216, Art. IV, Sect, 4.06(b)	Partially complied, regular report was not received during project implementation
Promptly after physical completion of the Project, but in any event not later than three months thereafter or such later date as maybe agreed for this purpose between the Recipient and ADB, the Recipient shall prepare and furnish ADB a report, in such form and in such detail as ADB shall reasonably request, on the execution and initial operation of the Project, including its cost, the performance by the Recipient of its obligation under the Grant Agreement and the accomplishment of the purposes of the GEF Grant	GA, G0216, Art. IV, Sect, 4.06(c)	Complied

Covenant	Reference in Grant Agreement	Status of Compliance
The Recipient shall make available, promptly as and when needed, the funds, facilities, services, land, and other resources as shall be necessary or required, in addition to the proceeds of the GEF grant, for carrying out of the Project and for the operation and maintenance of the Project facilities. The Recipient shall furnish to ADB, promptly at its request, evidence satisfactory to ADB that such funds, facilities, services, land, and other resources are available for the purposes related to the Project	GA, G0216, Art. IV, Sect, 4.07	Complied
The Recipient shall cause the Project to be carried out in accordance with plans, design standards, specifications, work schedules and construction methods acceptable to the Recipient and ADB, as applicable. When required by ADB, the Recipient shall furnish, or cause to be furnished, to ADB, promptly after their preparation, such plans, design standards, specifications and work schedules, and any material modifications subsequently made therein, in such detail as ADB reasonably request.	GA, G0216, Art. IV, Sect, 4.08	Complied
The Recipient shall cause the Project to be carried out with due diligence and efficiency and in conformity with sound applicable financial, road construction and development practices.	GA, G0216, Art. IV, Sect, 4.09 (a)	Complied
The Recipient shall ensure that the activities of its departments and agencies with respect to the carrying out the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	GA, G0216, Art. IV, Sect, 4.09 (b)	Complied
Whenever applicable, in carrying out the Project, the Recipient shall cause competent and qualified consultants and contractors, acceptable to the Recipient and ADB, to be employed to an extent and upon terms and conditions satisfactory to the Recipient and ADB.	GA, G0216, Art. IV, Sect, 4.10	Complied
The Recipient shall ensure that any facilities relevant to the Project are operated, maintained and repaired in accordance with sound operational and maintenance practices. The Recipient shall promptly as needed, make or cause to be made all necessary repairs and renewals thereof.	GA, G0216, Art. IV, Sect, 4.11	Complied
The Recipient shall ensure that the Grant Agreement is exempt from any taxes levied by, or in the territory of, the Recipient on or in connection with the execution, delivery, or registration thereof.	GA, G0216, Art. IV, Sect, 4.12	Complied

Covenant	Reference in Grant Agreement	Status of Compliance
Executing Agency Directorate General of Forest Protection and Nature Conservation as the project executing agency shall be responsible for carrying out the project.	GA, Sched. 3, para. 1.	Complied
Project Implementing Unit The Project Executing Agency shall establish a PIU within its Directorate of Area Conservation which shall handle the day today implementation of the Project.	GA, Sched. 3, para. 2.	Complied
Coordination The Project Executing Agency shall carry out the project in coordination with the PMU	GA, Sched. 3, para. 3.	Complied
Governance The recipient shall ensure that (i) relevant provisions of ADB's Anticorruption Policy (1998, as amended to date) are included in all bidding documents for the project; and (ii) all contracts financed by ADB in connection with the project include provisions specifying the right of ADB to audit and examine the records and accounts of Project Executing Agency, IAs, all contractors, suppliers, consultants and other service providers as they relate to the project	GA, Sched. 3, para. 4.	Complied
The recipient shall ensure that each IA establishes a procurement committee consisting of representatives from its Directorate of Area Conservation. and shall undertake and make available to ADB the annual inspection audits from an independent auditor	GA. Sched. 3, para. 5.	Complied
The recipient shall ensure that (i) PIU staff are trained on appropriate procurement and financial management procedures set forth in applicable provisions of the procurement, accounting and auditing rules and regulations of the Borrower and ADB; (ii) financial controls are established through periodic review, reconciliation and reporting of status of fund releases, disbursements and liquidation; and (iii) all community-based activities and goods procured for the community are communicated in advance on village notices and through facilitated dialogue with the respective community	GA. Sched. 3, para. 6.	Complied
Performance Monitoring Systems and Reviews Within 9 months of the Effective Date, the Project Executing Agency shall establish within the PIU a project performance monitoring system (“PPMS”) to monitor and evaluate the performance and development impact of the Project in form and	GA. Sched. 3, para. 7.	Not complied

Covenant	Reference in Grant Agreement	Status of Compliance
substance acceptable to ADB		
Safeguards The Project Executing Agency shall ensure that (a) the project is implemented in accordance with applicable laws and regulations of the Recipient, ADB's Environment Policy (2002), and the IEE; (b) any adverse environmental impacts are minimized by implementing the mitigation measures and the monitoring program set out in the EMP; (c) implementation of the EMP and any violation of the environmental standards are reported to ADB in accordance with the IEE; and	GA, Sched 3, para. 8.	Complied
The Project Executing Agency shall ensure that the project is implemented in accordance with applicable laws and regulations of the Recipient, ADB' Involuntary Resettlement Policy (1995), and the Resettlement Framework;	GA, Sched 3, para. 7.	Complied

FINANCIAL AND ECONOMIC RE-EVALUATION

Project Completion Economic and Financial Analysis
Integrated Citarum Water Resources Management Investment Program

A. OVERVIEW

1. This PCR analysis begins with a review of the appraisal analysis, including its methodology, data, and assumptions. Since the appraisal EFA spreadsheet model cannot be located, it was reconstructed based on tables in the appraisal EFA report. The reconstructed model's final economic internal rate of return (EIRR) differs very slightly from the appraisal analysis. The approximation helps to understand how cost and benefit streams were computed, and how key parameters were derived.

2. **Methodology**. To facilitate comparison, this analysis adopts the appraisal analysis' methodology and economic parameters to the extent possible. For examples, the evaluation considered the same project benefits; all financial and economic values are expressed in 2009 price level; and assumed analytical timeframe of 25 years, economic discount rate of 12%, shadow exchange rate factor (SERF) of 1.11, and shadow wage rate factor (SWRF) of 0.80.[1]

3. Other information that was reviewed and updated includes the project's implementation duration, actual project costs, incremental water supply, raw water tariffs charged by West Tarum Canal (WTC) Operator to different user groups, crop budgets, and economic valuation of raw water to domestic, municipal and industrial (DMI) users.

4. This analysis considers two primary sources of benefits as documented in the appraisal analysis report: (i) increased water supply to DMI users; and (ii) increased paddy cultivation productivity due to increased irrigation water supply. The appraisal analysis also mentioned in passing several secondary benefits, including increased yield owing to the System of *Rice* Intensification program, and health benefits owing to increased water supply for sanitation. However, in line with the appraisal analysis, this analysis will not quantify these secondary benefits.

5. **Increased water supply to DMI users**. This benefit stream depends on the incremental water supply to DMI users, itself a function of water supply forecasts in the with- and without-project scenarios. Between 2007 and 2010, WTC inflow decreased by 6.5% annually. Although appraisal analysis expected water flow to increase by 11.6% between 2008 and 2016, this has not materialized. In actuality, there is no significant increase in water inflow to WTC after the project, which increased by 1.6% between 2008 and 2015. The WTC is operating below its designed capacity due to factors that limit raw water demand: (i) deteriorated secondary irrigation canals; and (ii) insufficient water treatment capacity along the canal and in Jakarta. However, it is expected that, water treatment capacity will increase by 5 m^3/sec in 2023, and by another 5 m^3/sec in 2028. WTC Operator will increase the water inflow accordingly to meet the demand. This analysis assumes that, without the project, water flow remains at 39.6 m^3/sec from 2011, limiting water available to DMI users. In the with-project scenario, the water inflow between 2010 and 2016 are taken from actual data; between 2013 and 2017, water inflow

[1] A recent ADB project in Indonesia, Power Generation Sector Project (Loan INO 49203), uses a SERF of 1.15 and a SWRF of 0.90. Sensitivity analysis indicates that the analysis results is not sensitive to the SERF or SWRF.

remains at 41.3 m^3/sec (the average of 2014 to 2016); and will increase by an increment of 5.0 m^3/sec in 2023 and 2028 owing to water treatment capacity expansion.

6. **Increased cultivation productivity**. This benefit stream is a function of two factors: physical cultivation area around WTC and cropping intensity. The appraisal assumes that cultivation area remains at 57,900 ha. However, between 2002 and 2016, physical cultivation area is actually declining at an average rate of 2% per year, from 58,331 to 48,730 ha. This is due to the conversion of agricultural land for other purposes. As land conversion is driven by macro-socioeconomic factors, this analysis assumes that cultivation area continues to decline with or without the project, and at an annual rate of 2% per year throughout the analytical timeframe.

7. At appraisal, it was expected that, without the project, cropping intensity of paddy would reduce from about 1.74 in 2008 to 1.65 in 2015 due to irrigation water shortage. In contrast, in the with-project scenario, cropping intensity for paddy would increase from 1.74 to 1.97 over the same period due to deteriorated secondary irrigation canal systems. In actuality, cropping intensity remained stagnant throughout the period. However, in view of the rebound of WTC's water inflow, it can be expected that, in the project's absence, the cropping intensity could have been reduced from the 1.70 level. This analysis takes the appraisal analysis assumption that cropping intensity would reduce to 1.53 by 2025 in the without-project scenario. In the with-project scenario, cropping intensity would remain at 1.70, which was the observed during 2016.

8. **Analysis Results**. Based on the aforementioned conjecture, the project yields an EIRR of 23.7%. The sensitivity analysis considers several risk factors that will reduce future benefit streams. In general, the EIRR exceeds 12%, which was the threshold during appraisal.

9. This analysis deviates from the appraisal analysis in one important respect: the financial internal rate of return (FIRR) is not computed, because the WTC Operator cannot recover O&E expenses, let alone of the initial capital investment costs. Instead, operating expense ratio (OER) was computed.[2] The OER expresses operating costs as a percentage of operating revenue, and measures to what extent is an entity self-sustainable.

10. At the time of appraisal, the raw water tariff is less than 35% of O&M expenses. This implies an OER of 2.86 (=1/0.35). Since 2008, successive adjustments to water tariffs have reduced the average OER to about 1.48. Unless WTC Operator is allowed to continually raise water tariff to offset inflation, it must rely on government's budgetary support to finance routine and periodic O&M, with implications on the project's sustainability.

B. METHODOLOGY AND ASSUMPTIONS

11. **Analytical Timeframe**. Appraisal analysis expected the implementation period to be 5 years, between 2009 and 2014. However, in actuality, there was a 2-year delay. The implementation period was from 2009 to 2016 (Table 1). To be consistent with the appraisal analysis, the evaluation assumes a project life of 25 years, inclusive of the 7-year implementation period. For analytical purpose, the analytical timeframe is assumed to be for 25 years, from 2009 to 2034.

[2] This approach is in line with PFFM's suggestion. For many recent (sub)projects, FIRRs are not reported as they are not fully cost recovering.

Table 1: Significant Dates

	Appraisal (forecast)		PCR (actual)	
	begin	end	begin	end
Project start date	2009	…	2009	…
Project life (including construction)	25 years	…	25 years	…
Construction duration	5 years	…	7 years	…
Construction phase	2009	2014	2009	2016
Operation phase	2012	2034	2012	2034

12. The economic analysis has been conducted using ADB *Guidelines for the Economic Analysis of Projects.*[3] The major assumptions include:

(i) The evaluation analysis is carried out over 25 years, starting in 2009 and inclusive of a 7-year subproject implementation period.[4] The 25-year time frame is chosen to be consistent with the appraisal analysis.
(ii) To be consistent with the appraisal analysis, this evaluation takes 2009 as the base year. All financial figures, such as actual project costs, or prices of farm inputs and outputs, are deflated to 2009 price level.
(iii) The EFA uses the domestic price (Indonesia Rupiah, IDR) numeraire.
(iv) To covert the items' financial values into economic values, taxes and subsidies are net out from the gross financial values. Appropriate conversion factors were then applied on the tradable, non-tradable, skilled labor and unskilled labor component categories of each item to derive the final economic values.
(v) A shadow exchange rate factor (SERF) of 1.11 is applied to tradable component, and a shadow wage rate factor (SWRF) of 0.80 is applied to unskilled labor component. The other two components, non-tradable, and skilled labor, do not required adjustment – they are assumed to have a conversion factor of unity.
(vi) When data are available, for the main tradable agricultural inputs (fertilizers) and outputs (rice and corn), their economic values are estimated based on the World Bank's Commodity Price Forecasts of January 2018 after adjusting border prices to farm gate prices. Estimation of economic prices of these commodities was over the period 2019 to 2030.
(vii) While the latest ADB Economic Analysis Guidelines recommends an economic internal rate of return (EIRR) of 9%, this evaluation uses a 12.0% discount rate, to be consistent with the appraisal analysis.

C. PROJECT COSTS

13. During appraisal, the total project cost was estimated to be at 751.8 billion IDR (Table 2), and implementation period was expected to be between 2009 and 2013. The routine O&M requirement is expected to be at 10% of WTC rehabilitation cost of 42.7 billion IDR.

14. The actual project cost is about 488.0 billion IDR in nominal value, or 377.6 billion IDR after deflation to 2009 price level (Table 2). Implementation delay also extends the implementation end date by two years, to 2016. Table 3 provides a more detailed breakdown of the total project cost, inclusive of project management activities (20.9 billion IDR in real terms) and other planning or capacity building activities such as Road Map Management (16.0 billion

[3] ADB. 2017. *Guidelines for Economic Analysis of Projects*. Manila, Philippines.
[4] While the appraisal analysis assumes an implementation period of 5 years, as noted there is a 2-year delay in project completion.

IDR) and Improved Water Supply and Sanitation Initiatives (30.1 billion IDR). The costs of these activities are included in the analysis as costs, but the associated benefits are not quantified. For economic analysis, the financial costs are converted to economic values using appropriate conversion factors for the tradable, non-tradable, skilled labor, and unskilled labor content. The derivations are also presented in Table 3.

15. Rehabilitation increases the canal capacity from about 51.1 m^3/s to 70 m^3/sec at the head, and from 16 to 31 m^3/sec at the tail. Of the incremental inflow of 15 m^3/sec at the tail, one third (5 m^3/sec) is designated for flushing and two thirds (10 m^3/sec) for DMI users after treatment. Currently, the WTC is operating below its designed capacity, as reflected in by the water (Table 4, second panel), due to (i) deteriorated secondary irrigation canals; and (ii) insufficient water treatment capacity along the canal and in Jakarta. However, it is expected that, water treatment capacity will increase by 5 m^3/sec in 2023, and by another 5 m^3/sec in 2028. WTC Operator will adjust the water inflow accordingly to meet the demand.

16. Historically, WTC Operator's O&M costs is about 248.6 IDR/m^3 of water supplied. This analysis assumes that the project will retain 90% of the existing (without-project) O&M costs, plus an additional 10% (26.4 billion IDR) of WTC Rehabilitation cost of 264.3 billion IDR (Sections L2500 and L2501).

Table 2: Forecasted and Actual Project Costs

	Total	2009	2010	2011	2012	2013	2014	2015	2016
Appraisal (forecast)									
Capital cost (mil IDR)	751,793	85,389	118,191	215,340	224,207	108,666	0	0	0
Cumulative progress (%)	100.0%	11.4%	27.1%	55.7%	85.5%	100.0%	100.0%	100.0%	100.0%
PCR (actual)									
IDR price index		1.00	1.05	1.10	1.16	1.22	1.30	1.38	1.45
Capital cost (mil IDR, nominal)	488,064	1,147	35,957	35,810	27,900	66,257	39,388	173,192	108,414
Capital cost (mil IDR, real)	377,577	1,147	34,324	32,479	24,141	54,422	30,406	125,687	74,970
Cumulative progress (%)	100.0%	0.3%	9.4%	18.0%	24.4%	38.8%	46.9%	80.1%	100.0%

mil IDR = million Indonesian rupiah
Source: OECD: https://data.oecd.org/price/inflation-cpi.htm (accessed July 2017).

Table 3: Actual Economic Cost of ICWRMI Program (million IDR, real)

	Fin. Value	Tax rate	Net of tax	Economic value				Econ. value[a]	CF
				Tradable	Non-tradable	Skilled labor	Unskilled labor		
Conversion factor				1.11	1.00	1.00	0.80		
Capital costs									
Institutions and Planning for IWRM	0	6%	0	20%	40%	40%	0%	0	0.00
Road Map Management (L2501)	16,025	4%	15,408	20%	40%	40%	0%	15,747	0.98
Water Resource Development and Management	0	4%	0	40%	20%	40%	0%	0	0.00
Rehabilitation of the WTC (L2500)	159,866	9%	146,666	40%	20%	40%	0%	153,119	1.09
Rehabilitation of the WTC (L2501)	104,461	9%	95,836	40%	60%	0%	0%	100,053	1.09
Improved Land and Water Management (L2501)	25,912	6%	24,445	40%	60%	0%	0%	25,521	0.96
Support for Community- and NGO-driven Initiatives for Improved Water Supply and Sanitation (L2501)	30,067	4%	28,911	40%	30%	0%	30%	28,448	1.01
DED for Upgrading of Bandung Bulk Water Sources (L2501)	0	2%	0	20%	60%	20%	0%	0	0.00
Environmental Protection	0	2%	0	30%	40%	0%	30%	0	0.00
Development and Implementation of	9,402	4%	9,040	30%	30%	40%	0%	9,339	0.98

River Basin Quality Improvement Strategy and Action Plans (L2501)									
Program Management	0	4%	0	20%	60%	20%	0%	0	0.00
Program Management (L2501)	20,853	4%	20,051	20%	60%	20%	0%	20,492	0.98
Independent Monitoring and Evaluation (L2501)	10,990	4%	10,568	0%	20%	70%	10%	10,356	0.98
Total capital costs	**377,577**	**7.6%**	**350,926**	**36.6%**	**37.9%**	**22.8%**	**2.7%**	**363,076**	
O&M Costs (10% of WTC rehabilitation cost	26,433	9.0%	24,250	30%	60%	10%	20%	28,930	1.09

CF = conversion factor, O&M = operation and maintenance

[a] Economic values are derived from financial values by first netting out taxes, and applying a shadow exchange rate factor (SERF) of 1.11 on tradable component, and a shadow wage rate factor (SWRF) of 0.80 unskilled labor.

D. PROJECT BENEFITS

17. This analysis considers two primary sources as documented in the appraisal analysis report: (i) increased water supply to domestic, municipal and industrial (DMI) users; and (ii) increased paddy cultivation area due to increased irrigation water supply. The appraisal analysis also mentioned in passing several secondary benefits, including increased yield owing to the System of *Rice* Intensification program, and health benefits owing to increase water supply for toilet flushing. However, in line with the appraisal analysis, this analysis will not attempt to quantify these secondary benefits.

1. Increased Water Supply to DMI Users

18. Table 4 presents the forecasted and actual water inflow to WTC before and after the project. Appraisal analysis estimated that water inflow would increase from 54.0 in 2008 to 60.1 m^3/sec in 2016 at the head of the canal, implying an increase in water supply by 11.2%. In actuality, the WTC Operator controls the water inflow due to limited demand, such that inflow increased by only 1.6%, from 40.2 m^3/sec to 40.8 m^3/sec over the same period. As stated, currently the WTC is operating below its designed capacity. However, it is expected that, water treatment capacity will increase by 5 m^3/sec in 2023, and by another 5 m^3/sec in 2028. WTC Operator will adjust the water inflow accordingly to meet the demand. While rehabilitation of secondary irrigation canals is envisaged, it is uncertain when rehabilitation occur. Therefore, increase in cultivation area is not considered in this analysis.

Table 4: West Tarum Canal (WTC) Average Water Flow Before and After the Project

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Appraisal (forecast) [a]										
Water flow (m3/sec)	53.10	54.05	55.01	53.10	55.47	58.00	58.50	59.02	59.56	60.1
Water flow (million m3/year)	1,675	1,704	1,735	1,675	1,749	1,829	1,845	1,861	1,878	1,896
Growth between 2008 and 2016	11.2%									
PCR (actual) [b]										
Water flow (m3/sec)	43.83	40.18	41.04	33.56	36.84	37.47	37.26	42.20	40.78	40.84
Water flow (million m3/year)	1,382	1,267	1,294	1,058	1,162	1,182	1,175	1,331	1,286	1,288
Growth between 2008 and 2016	1.6%									
Project Progress										
Actual project disbursement (billion IDR)	0	0	1.15	34.32	32.48	24.14	54.42	30.41	125.69	74.97
Cumulative progress (%)	0.0%	0.0%	0.3%	9.4%	18.0%	24.4%	38.8%	46.9%	80.1%	100.0%

Source:

[a] Appraisal EFA Report for Integrated Citarum Water Resource Management Investment Program.

[b] WTC Operator.

19. An economic evaluation requires a comparison between the without- and with-project scenarios. Given the counterfactual is never observed, this analysis makes a conjecture. In the without- project scenario, water inflow from 2011 will remain at 39.7 m^3/sec, which is the average inflow between 2007 and 2010, limiting water available to DMI users. In the with-project scenario, water inflow will remain at 41.3 m^3/sec from 2017, which is the average between 2014 and 2016 (Table 5). In addition, in 2023 and 2028, the inflow will increase by 5 m^3/sec to meet increased demand from water treatment plants. The sensitivity analysis will consider several water inflow scenarios.

Table 5: WTC Water Inflow Assumptions for PCR Analysis

	2010	2011	2012	2013	2014	2015	2016	2017-2022	2023-2027	2028-2034
Without-project										
Water flow (million m3/year)	1,058	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Water flow (m3/sec)	33.56	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65
PAM Jaya	26.20	30.96	30.96	30.96	30.96	30.96	30.96	30.96	30.96	30.96
PDAM Kab/Kota	7.26	8.58	8.58	8.58	8.58	8.58	8.58	8.58	8.58	8.58
Community	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Industry	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
With-project										
Water flow (million m3/year)	1,058	1,250	1,250	1,250	1,331	1,286	1,288	1,302	1,459	1,617
Water flow (m3/sec)	33.56	39.65	39.65	39.65	42.20	40.78	40.84	41.27	46.27	51.27
PAM Jaya	26.20	30.96	30.96	30.96	32.96	31.84	31.89	32.23	37.23	42.23
PDAM Kab/Kota	7.26	8.58	8.58	8.58	9.13	8.82	8.84	8.93	8.93	8.93
Community	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Industry	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Incremental										
Water flow (million m3/year)	0	0	0	0	81	36	38	51	209	367
Water flow (m3/sec)	0.00	0.00	0.00	0.00	2.55	1.13	1.19	1.62	6.62	11.62
PAM Jaya	0.00	0.00	0.00	0.00	1.99	0.88	0.93	1.27	6.27	11.27
PDAM Kab/Kota	0.00	0.00	0.00	0.00	0.55	0.24	0.26	0.35	0.35	0.35
Community	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industry	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

mil = million
Source: WTC Operator (2010-2016), ADB estimates (2017 onward).

20. Data on water supply to DMI users were obtained for years 2010 to 2016. Table 6 presents water supply forecasts to DMI users in the with- and without-project scenarios. For different user groups, the forecasts are derived by multiplying expected WTC water inflow (Table 5) with the average weight of its customers as percentages of the total quantity of raw water supplied between 2010 to 2016.

Table 6: WTC Water Supply to DMI Users for PCR Analysis (million m3)

	2010	2011	2012	2013	2014	2015	2016	2017-2022	2023-2027	2028-2034
Without-project										
PAM Jaya	826.29	976.38	976.38	976.38	976.38	976.38	976.38	976.38	976.38	976.38
PDAM Kab/Kota	228.96	270.55	270.55	270.55	270.55	270.55	270.55	270.55	270.55	270.55
Community	1.55	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
Industry	0.35	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Total	1,057.15	1,249.17	1,249.17	1,249.17	1,249.17	1,249.17	1,249.17	1,249.17	1,249.17	1,249.17
With-project										
PAM Jaya	826.29	976.38	976.38	976.38	1,039.29	1,004.16	1,005.71	1,016.39	1,174.07	1,331.75
PDAM Kab/Kota	228.96	270.55	270.55	270.55	287.98	278.24	278.67	281.63	281.63	281.63
Community	1.55	1.83	1.83	1.83	1.95	1.89	1.89	1.91	1.91	1.91
Industry	0.35	0.41	0.41	0.41	0.44	0.42	0.43	0.43	0.43	0.43
Total	1,057.15	1,249.17	1,249.17	1,249.17	1,329.66	1,284.71	1,286.70	1,300.36	1,458.04	1,615.72
Incremental										
PAM Jaya	0.00	0.00	0.00	0.00	62.91	27.78	29.33	40.01	197.69	355.37
PDAM Kab/Kota	0.00	0.00	0.00	0.00	17.43	7.70	8.13	11.09	11.09	11.09
Community	0.00	0.00	0.00	0.00	0.12	0.05	0.06	0.08	0.08	0.08
Industry	0.00	0.00	0.00	0.00	0.03	0.01	0.01	0.02	0.02	0.02
Total	0.00	0.00	0.00	0.00	80.49	35.54	37.53	51.19	208.87	366.55

Source: WTC Operator (2010-2016), ADB estimates (2017 onward).

21. **Raw water tariff**. At appraisal, the WTC Operator charged a raw water tariff of 87 IDR/m^3, which was underpriced and is less than 35% of O&M costs.[5] Since then, the tariffs were adjusted periodically, although they are still insufficient to recoup WTC's O&M costs (paras. 34 and 35). Note that there is no tariff relating to irrigation water. For the DMI users, tariff adjustment for the Jakarta water utilizes (PDAM Jaya) has been frequent. For the other two client groups (non-Jakarta utilities and industrial users), adjustments were sparse, such that the tariffs decreased in real terms for some years. The evaluation assumes that the real tariff will continue to increase at an average growth rates of 0.47%, 1.96%, and 2.69% for the three client groups. This assumption will affect the financial analysis, but not the economic analysis, as the economic value of water depends not on the financial tariff price but rather on the water users' willingness to pay.

Table 7: Raw Water Tariff (IDR/m^3)

	2010	2011	2012	2013	2014	2015	2016	Average
Water tariff (nominal)								
DMI – JKT	161.0	172.0	181.0	189.7	202.7	215.7	228.7	…
DTI - Curug Bekasi	65.3	65.3	81.4	81.4	98.3	98.3	98.3	…
Industries	106.5	106.5	141.7	165.5	165.5	165.5	165.5	…
Water tariff (real)								
IDR price index (2009 = base)	1.00	1.05	1.10	1.16	1.22	1.30	1.38	...
DMI - JKT	153.7	156.0	156.6	155.8	156.4	156.5	158.1	…
DTI - Curug Bekasi	62.3	59.2	70.4	66.8	75.9	71.3	68.0	…
Industries	101.6	96.6	122.6	135.9	127.8	120.1	114.4	…
Annual growth rate (real)								
DMI - JKT		1.50%	0.39%	-0.54%	0.43%	0.04%	1.03%	0.47%
DTI - Curug Bekasi		-4.98%	18.97%	-5.07%	13.53%	-5.99%	-4.71%	1.96%
Industries		-4.98%	26.97%	10.88%	-6.02%	-5.99%	-4.71%	2.69%

Source: WTC Operator.

22. **Economic value of raw water to DMI users**. Appraisal analysis estimates the economic value of raw water for DMI users to be 700 IDR/m^3. This was derived by taking the difference between a retail water tariff of 8,000 IDR/m^3, which was considered affordable for domestic households (given a per capita consumption of 200 liters per day); and an estimated

[5] Para. 117, appraisal EFA report.

retail water tariff of 7,300 IDR/m^3, which was required by water utilities to yield a financial return above 20%.[6] Since the annex table which documents the derivation of the said 7,300 IDR/m^3 tariff is missing, it is not possible to review how the figure was derived.

23. The approach taken seems problematic in several ways: (i) the economic value should depend on the value assigned to it by consumer, not supplier, nor on any notion of financial viability; (ii) at best, the 700 IDR/m^3 seems to represent the consumer surplus of treated water and not the willingness to pay for untreated raw water; and (iii) 700 IDR/m^3 is quite high compared to the actual tariffs in 2016 which ranges from 98.7 to 228.7 IDR/m^3 (Table 7).

24. To produce conservative estimates, this analysis assumes an economic value of 257 IDR/m^3. This is derived, first by estimating the unsubsidized average tariff required to recoup WTC's O&M costs (paras. 34 and 35), which is about 233 IDR/m^3 and second by adjusting this value by 110% (257 = 233*1.1).[7] An economic value of 257 IDR/m^3 is considerably lower than the appraisal estimates but is more in line with the financial tariff. A sensitivity analysis is conducted for a scenario with an economic value of 700 IDR/m^3.

2. Increased Paddy Cultivation Productivity

25. This benefit stream is a function of two factors: physical cultivation area around WTC and cropping intensity. The appraisal assumes that cultivation area remains at 57,900 ha. However, between 2002 and 2016, physical cultivation area is declining at an average rate of 2% per year, from 58,331 to 48,730 ha. This is due to the conversion of agricultural land for other purposes. As land conversion is driven by macro-socioeconomic factors, this analysis assumes that cultivation area continues to decline with or without the project, and at an annual rate of 2% per year throughout the analytical timeframe.

26. At appraisal, it was expected that, without the project, cropping intensity for paddy would reduce from about 1.74 in 2008 to 1.65 in 2015. Due to irrigation water shortage, the paddy farmland will be converted for corn cultivation, corn being taken as a representative dry season crop. In contrast, in the with-project scenario, cropping intensity for paddy would increase from 1.74 to 1.97 over the same period. With project, farmers switch from corn to paddy cultivation. More paddy will be cultivated at the expense of corn. Irrigation benefit stream was computed by taking the difference in income between paddy and corn.

27. In actuality, cropping intensity has remained stagnant throughout the period. However, in view of the declining trend in water inflow between 2007 and 2010 (Table 4), it can be expected that cropping intensity could have been reduced from the 1.70 level in the project's absence. This analysis takes the appraisal analysis assumption that cropping intensity would reduce to 1.53 by 2025 in the without-project scenario. In the with-project scenario, cropping intensity would remain at 1.70, which was the observed during 2016. While rehabilitation of secondary irrigation canals is envisaged, resulting in greater project benefit, the commencement dates of these potential rehabilitation projects are uncertain. Therefore, this potential benefit stream is not considered in the analysis.

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[6] Paras. 135 and 137 of appraisal EFA report read: "The average water rate for Jakarta can be raised to Rp8,000/m3… [F] or investors requiring a 20% return on their investment (14% for cost of funds and 6% for profit) will require the tariff rate to be set at Rp7,300/m3. If raw water cost is viewed as the residual cost, then the water tariff has to be set above this price of Rp7,300/m3. With a price of Rp8,000/m3, then the investors will be willing to pay Rp700/m3 for raw water."

[7] As a rule of thumb, the willingness to pay for water is measured at 10-15% above the tariff.

28. Table 8 presents the physical cultivation area, effective cultivation area and the implied cropping intensity in the with- and without-project scenarios. Note that during the dry reason, paddy will replace corn as the preferred crop.

Table 8: Paddy and Corn Cultivation Area (ha)

	2010	2011	2012	2013	2014	2015	2016	2017	2020	2025	2030
Physical cultivation area	53,768	49,562	53,337	52,678	48,985	48,730	47,669	46,712	43,956	39,718	35,890
Without-project											
Wet season paddy	51,022	46,719	46,674	43,290	43,562	44,363	43,455	42,291	38,983	33,992	30,715
Dry season paddy	41,077	37,553	40,081	39,260	36,208	35,724	34,645	33,657	30,859	26,652	24,083
Corn											
Cropping intensity (paddy only)	1.71	1.70	1.63	1.50	1.63	1.64	1.64	1.63	1.59	1.53	1.53
With-project											
Wet season paddy	51,022	46,719	46,674	43,290	43,562	44,363	44,102	43,217	40,667	36,746	33,204
Dry season paddy	41,077	37,553	41,059	35,946	39,527	40,124	36,851	36,111	33,981	30,705	27,745
Corn											
Cropping intensity (paddy only)	1.71	1.70	1.64	1.50	1.70	1.73	1.70	1.70	1.70	1.70	1.70
Incremental											
Wet season paddy	0	0	0	0	0	0	647	926	1,684	2,755	2,489
Dry season paddy	0	0	978	-3,314	3,319	4,400	2,206	2,454	3,121	4,053	3,662
Corn	0	0	-978	3,314	-3,319	-4,400	-2,206	-2,454	-3,121	-4,053	-3,662

Source: ADB estimates.

29. Increased irrigation water would allow farmers to grow paddy which yields higher income than corn. Table 9 compares the paddy and corn budgets in the appraisal with the updated budgets used in this evaluation. The figures are in 2009 price level and financial values. In the economic analysis, the financial figures are converted to economic values using appropriate conversion factors.

Table 9: Paddy and Corn Budgets in Financial Value (million IDR/ha)

	Wet Season Paddy		Dry Season Paddy		Corn	
	Appraisal	PCR[a]	Appraisal	PCR[a]	Appraisal	PCR[a]
Income	13.26	8.78	n.a.	14.83	9.25	10.34
Farming Cost						
Labor						
Land preparation	0.50	1.24	n.a.	1.36	0.25	0.90
Planting	0.25	0.85	n.a.	0.96	0.10	0.58
Maintenance	…	0.60	n.a.	0.69	…	0.54
Fertilizer application	0.25	0.15	n.a.	0.25	0.10	0.32
Weeding	0.38	0.13	n.a.	0.25	0.18	0.09
Harvesting, threshing and transportation	0.38	1.25	n.a.	1.77	0.08	1.13
Material						
Seeds	0.11	0.24	n.a.	0.35	0.68	0.63
Fertilizer and pesticide	1.09	0.64	n.a.	1.25	0.78	1.06
Tractor Rental	0.40	0.15	n.a.	0.28	0.40	0.34
Others	0.10	0.31	n.a.	0.42	0.00	2.19
Agricultural Services	…	0.00	n.a.	0.00	…	0.00
Lease Land	…	1.20	n.a.	3.28	…	0.15
Total Farming Cost	**3.46**	**6.76**	n.a.	**10.88**	**2.55**	**7.92**
Net Income	**9.80**	**2.02**	**n.a.**	**3.95**	**6.70**	**2.42**

[a] Source: Data dikutip dari Publikasi Statistik Indonesia (2013). Prices are deflated to 2009 price level.

E. ANALYSIS RESULTS

1. Financial Analysis

30. A financial analysis is conducted based on estimates on with-project raw water sales (Table 6), raw water tariff (Table 7), and O&M estimate (paras. 13-15). As stated, historically WTC raw water tariff is less than 35% of O&M costs. Although tariffs have increased in subsequent years, the data indicates that they are still insufficient to recoup O&E costs, let alone of the initial capital investment costs.[8] In this instance, FIRR which will be a negative figure is not a meaningful metrics for financial analysis. A more appropriate measure would be the OER, which expresses operating costs as a percentage of operating revenue, and measures to what extent an entity is self-sustainable. An OER less than unity indicates that the project can generate more operating revenues than operating costs.

31. Table 10 summarizes the project's financial cash flow statement. The average OER is 1.37, reduced from the 2008 level of around 2.86 but is still greater than unity. Unless WTC Operator is allowed to continually raise water tariff to offset inflation, it must rely on government's budgetary support to finance routine and periodic O&M.[9]

2. Economic Analysis

32. On the cost side, the entirety of the project costs, including those related to project management and capacity building, are included in the economic analysis. On the benefit side, the analysis considers two sources of benefits: (i) increased water supply to DMI users; and (ii) increased paddy cultivation area.

33. For the benefit to DMI users, the following sets of data are used: (i) incremental raw water sales in the with- and without-project scenarios (Table 6); and (ii) economic valuation of raw water (280 IDR/m^3 for base case, paras. 22-24). For the benefit due to increased paddy cultivation, the following sets of data are used: (i) forecasts on cultivation area in with- and without-project scenarios (Table 8); and (ii) crop budgets (Table 9). The resulting incremental economic resource flow statement is presented in Table 11. The statements for the with- and without-project scenarios are presented in Annex 1. Overall, the project yields an EIRR of 23.7%.

[8] The financial projections are based on forecasts on sales and tariff, and some indicative financial data obtained from WTC Operator. As such, the results can only be interpreted as indicative.

[9] WTC Operator is a state-owned enterprise and receives budgetary support of about 27.73 and 31.61 billion IDR respectively, in 2014 and 2015.

Table 10: Financial Cash Flow Statement (With-Project Scenario)

	Unit	2009 Yr 1	2010 Yr 2	2011 Yr 3	2012 Yr 4	2013 Yr 5	2014 Yr 6	2015 Yr 7	2016 Yr 8	2017 Yr 9	2020 Yr 12	2025 Yr 17	2030 Yr 22	2034 Yr 26
Construction phase	flag	1	1	1	1	1	1	1	1	-	-	-	-	-
Operation phase	flag	-	-	-	1	1	1	1	1	1	1	1	1	1
WITH-PROJECT SCENARIO														
Ramp up														
Project completion cumulative progress	%	0.00%	0.00%	0.00%	24.39%	38.80%	46.86%	80.14%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Revenue														
Raw water supply														
PAM Jaya	mil m3	1,011	826	976	976	976	1,039	1,004	1,006	1,016	1,016	1,174	1,332	1,332
PDAM Kab/Kota	mil m3	280	229	271	271	271	288	278	279	282	282	282	282	282
Community	mil m3	2	2	2	2	2	2	2	2	2	2	2	2	2
Industry	mil m3	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	mil m3	1,293	1,057	1,249	1,249	1,249	1,330	1,285	1,287	1,300	1,300	1,458	1,616	1,616
Raw water tariff														
PAM Jaya	IDR/m3	0	154	156	157	156	156	156	158	159	161	165	169	172
PDAM Kab/Kota	IDR/m3	0	62	59	70	67	76	71	68	69	73	81	89	96
Community	IDR/m3	0	0	0	0	0	0	0	0	0	0	0	0	0
Industry	IDR/m3	0	102	97	123	136	128	120	114	118	127	145	166	185
PAM Jaya	mil IDR	0	127,004	152,318	152,917	152,095	162,588	157,150	159,018	161,469	163,780	193,724	225,008	229,313
PDAM Kab/Kota	mil IDR	0	14,263	16,014	19,051	18,084	21,853	19,849	18,943	19,518	20,686	22,788	25,105	27,127
Community	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Industry	mil IDR	0	35	40	51	56	56	51	49	50	55	62	71	79
Total revenue	**mil IDR**	**0**	**141,303**	**168,371**	**172,019**	**170,236**	**184,497**	**177,051**	**178,010**	**181,038**	**184,521**	**216,575**	**250,184**	**256,518**
O&M Cost														
Existing	mil IDR	0	0	0	280,903	280,903	280,903	280,903	280,903	280,903	280,903	280,903	280,903	0
Incremental	mil IDR	0	0	0	6,447	10,257	12,385	21,184	26,433	26,433	26,433	26,433	26,433	26,433
Total O&M cost	mil IDR	**0**	**0**	**0**	**287,350**	**291,160**	**293,289**	**302,087**	**307,336**	**307,336**	**307,336**	**307,336**	**307,336**	**26,433**
Capex														
Road Map Management (L2501)	mil IDR	0	2,935	3,441	3,313	2,864	2,924	0	549	0	0	0	0	0
Water Resource Development and Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Rehabilitation of the WTC (L2500)	mil IDR	0	3,538	2,904	1,693	21,104	12,117	70,546	47,964	0	0	0	0	0
Rehabilitation of the WTC (L2501)	mil IDR	0	7,118	7,320	4,579	14,970	8,608	41,674	20,192	0	0	0	0	0
Improved Land and Water Management (L2501)	mil IDR	1,147	15,566	7,719	0	0	0	0	1,480	0	0	0	0	0
Support for Community- and NGO-driven Initiatives for Im	mil IDR	0	1,290	7,060	11,731	9,319	668	0	0	0	0	0	0	0
DED for Upgrading of Bandung Bulk Water Sources (L2501	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Protection	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Development and Implementation of River Basin Quality I	mil IDR	0	0	0	0	0	2,220	7,182	0	0	0	0	0	0
Program Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Program Management (L2501)	mil IDR	0	3,877	3,053	2,349	2,885	1,783	4,081	2,825	0	0	0	0	0
Independent Monitoring and Evaluation (L2501)	mil IDR	0	0	983	476	3,281	2,087	2,204	1,960	0	0	0	0	0
Total captial costs	mil IDR	**1,147**	**34,324**	**32,479**	**24,141**	**54,422**	**30,406**	**125,687**	**74,970**	**0**	**0**	**0**	**0**	**0**
Total Costs	mil IDR	**1,147**	**34,324**	**32,479**	**311,491**	**345,582**	**323,695**	**427,775**	**382,306**	**307,336**	**307,336**	**307,336**	**307,336**	**26,433**
Net Revenue	mil IDR	**-1,147**	**106,979**	**135,892**	**-139,473**	**-175,346**	**-139,198**	**-250,724**	**-204,296**	**-126,298**	**-122,815**	**-90,761**	**-57,151**	**230,086**
Operating Expense Ratio (OER)	#		**0.00**	**0.00**	**1.67**	**1.71**	**1.59**	**1.71**	**1.73**	**1.70**	**1.67**	**1.42**	**1.23**	**0.10**
Average OER (between 2017 and 2034)	#	**1.37**												
Maximum OER (between 2017 and 2034)	#	**1.70**												

Table 11: Economic Resource Flow Statement (Incremental)

	Unit	2009 Yr 1	2010 Yr 2	2011 Yr 3	2012 Yr 4	2013 Yr 5	2014 Yr 6	2015 Yr 7	2016 Yr 8	2017 Yr 9	2020 Yr 12	2025 Yr 17	2030 Yr 22	2034 Yr 26
Construction phase	flag	1	1	1	1	1	1	1	1	-	-	-	-	-
Operation phase	flag	-	-	-	1	1	1	1	1	1	1	1	1	1
INCREMENTAL														
Irrigation Benefits														
Total Incremental Income	mil IDR	0	0	0	6,442	0	20,940	27,763	21,922	27,086	41,362	62,745	58,723	54,149
Incremental Farming Cost														
Labour		0	0	0	-3,112	0	-10,562	-14,003	-1,513	72	4,406	10,554	9,536	8,793
Material		0	0	0	-1,882	0	-6,385	-8,466	-2,367	-2,035	-1,118	196	177	163
Agricultural services	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Lease land	mil IDR	0	0	0	-162	0	-550	-729	2,342	3,468	6,530	10,855	9,809	9,044
Rental tools	mil IDR	0	0	0	-365	0	-1,240	-1,644	-402	-313	-67	284	256	236
Fuel	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	mil IDR	0	0	0	-2,357	0	-8,000	-10,607	-4,268	-4,413	-4,789	-5,297	-4,786	-4,414
Total farming cost	mil IDR	**0.0**	**0.0**	**0.0**	**-9,760.2**	**0.0**	**-33,121.9**	**-43,914.9**	**-8,575.9**	**-5,256.4**	**3,846.1**	**16,786.5**	**15,168.3**	**13,986.8**
Net Incremental Income	mil IDR	**0.0**	**0.0**	**0.0**	**16,201.9**	**0.0**	**54,061.7**	**71,678.1**	**30,497.9**	**32,342.1**	**37,516.0**	**45,958.2**	**43,555.1**	**40,162.4**
DMI Benefits														
Revenue														
Raw water supply														
PAM Jaya	mil m3	0	0	0	0	0	63	28	29	40	40	198	355	1,332
PDAM Kab/Kota	mil m3	0	0	0	0	0	17	8	8	11	11	11	11	282
Community	mil m3	0	0	0	0	0	0	0	0	0	0	0	0	2
Industry	mil m3	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	mil m3	0	0	0	0	0	80	36	38	51	51	209	367	1,616
Economic value of water														
PAM Jaya	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
PDAM Kab/Kota	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
Community	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
Industry	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
PAM Jaya	mil IDR	0	0	0	0	0	16,148	7,130	7,528	10,269	10,269	50,740	91,211	341,815
PDAM Kab/Kota	mil IDR	0	0	0	0	0	4,474	1,976	2,086	2,845	2,845	2,845	2,845	72,285
Community	mil IDR	0	0	0	0	0	30	13	14	19	19	19	19	490
Industry	mil IDR	0	0	0	0	0	7	3	3	4	4	4	4	110
Total revenue	**mil IDR**	**0**	**0**	**0**	**0**	**0**	**20,659**	**9,122**	**9,632**	**13,138**	**13,138**	**53,609**	**94,080**	**414,701**

O&M Cost														
Existing	mil IDR	0	0	0	-32,403	-32,403	-32,403	-32,403	-32,403	-32,403	-32,403	-32,403	-32,403	0
Incremental	mil IDR	0	0	0	7,056	11,226	13,556	23,186	28,930	28,930	28,930	28,930	28,930	28,930
Total O&M cost	mil IDR	**0**	**0**	**0**	**-25,347**	**-21,177**	**-18,847**	**-9,217**	**-3,473**	**-3,473**	**-3,473**	**-3,473**	**-3,473**	**28,930**
Capex														
Road Map Management (L2501)	mil IDR	0	2,884	3,381	3,255	2,814	2,873	0	539	0	0	0	0	0
Water Resource Development and Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Rehabilitation of the WTC (L2500)	mil IDR	0	3,872	3,178	1,852	23,099	13,262	77,213	52,496	0	0	0	0	0
Rehabilitation of the WTC (L2501)	mil IDR	0	7,791	8,011	5,012	16,385	9,421	45,612	22,100	0	0	0	0	0
Improved Land and Water Management (L2501)	mil IDR	1,106	15,008	7,442	0	0	0	0	1,426	0	0	0	0	0
Support for Community- and NGO-driven Initiatives for Im	mil IDR	0	1,303	7,135	11,855	9,417	675	0	0	0	0	0	0	0
DED for Upgrading of Bandung Bulk Water Sources (L2501	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Protection	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Development and Implementation of River Basin Quality I	mil IDR	0	0	0	0	0	2,182	7,057	0	0	0	0	0	0
Program Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Program Management (L2501)	mil IDR	0	3,810	3,000	2,309	2,835	1,752	4,011	2,776	0	0	0	0	0
Independent Monitoring and Evaluation (L2501)	mil IDR	0	0	966	468	3,224	2,050	2,166	1,926	0	0	0	0	0
Total captial costs	mil IDR	**1,106**	**34,668**	**33,114**	**24,752**	**57,773**	**32,216**	**136,058**	**81,265**	**0**	**0**	**0**	**0**	**0**
Total Costs	mil IDR	**1,106**	**34,668**	**33,114**	**-595**	**36,596**	**13,369**	**126,842**	**77,792**	**-3,473**	**-3,473**	**-3,473**	**-3,473**	**28,930**
Net Economic Resources Flow	mil IDR	**-1,106**	**-34,668**	**-33,114**	**16,797**	**-36,596**	**61,353**	**-46,041**	**-37,663**	**48,952**	**54,126**	**103,040**	**141,108**	**425,933**
ENPV	mil IDR	**173,431**												
EIRR	%	**23.7%**												

3. Sensitivity Analysis

34. Sensitivity tests were performed on several risk factors highlighted in the preceding sections, including (i) water inflows in the without-project scenario; (ii) economic value of raw water; (iii) paddy price; and (iv) paddy cultivation area.

35. The base case assumes that in the without-project scenario, water inflow will remain at 39.6 m^3/sec from 2011. In the with-project scenario, water inflow will remain at 41.3 m^3/sec between 2017 and 2022, but will increase to 46.3 m^3/sec between 2023 and 2027, and again to 51.3 m^3/sec between 2028 to 2034, due to increase in water treatment capacity. Any changes in inflow will affect water supply to DMI users. Between 2007 and 2010, water inflow decreased by about 6.5% per year. Had this trend continue in the without-project scenario, the EIRR would increase to 29.7% since the incremental benefit becomes greater. Conversely, if the without-project inflow increases by 10%, from the historical average of 39.6 m^3/sec to 43.6 m^3/sec, the EIRR would reduce to 22.8%. If the envisage water treatment capacity expansion in 2023 and 2028 is delayed by two years, the EIRR would reduce to 22.4%.

36. The base case assigns an economic value of 257 IDR/m^3 on raw water. If the economic value is reduced by 10%, the EIRR would become 23.0%. On the other hand, if the appraisal assumption of 700 IDR/m^3 is adopted, the EIRR would become 33.4%.

37. If paddy price is reduced by 10% while holding input costs constant, the EIRR would reduce to 19.9%. In all scenarios, the EIRR exceeds the required 12% threshold for a efficient rating. If cultivation area in the without-project scenario increases by 10%, the EIRR is 13.2%. Conversely, if cultivation area in the with-project scenario decreases by 10%, the EIRR is 11.4%. In summary, the base case analysis is robust against downside risks.

Table 12: Sensitivity Analysis

	OER	EIRR (%)	ENPV (IDR billions)	SI (%)	SV
Base Case	**1.37**	**23.7%**	**173.4**		
DMI user benefit					
Without-project water inflow declines at 6.5% p.a.	1.28	29.7%	252.6	4.6	0.2
Without-project water inflow increase by 10%	1.42	22.8%	157.0	-0.9	-1.1
Water treatment expansion delayed by 2 years (to 2025 and 2030)	1.42	22.4%	142.3	-1.8	-0.6
Economic value of raw water decreases by 10%	1.37	23.0%	158.8	-0.8	-1.2
Economic value of raw water at 700 IDR/m3 (appraisal estimate)	1.37	33.4%	426.5	14.6	0.1
Paddy cultivation productivity					
Paddy price decreases by 10%	1.37	22.6%	156.2	-1.0	-1.0
Without-project cultivation area increases by 10%	1.37	13.2%	20.7	-8.8	-0.1
With-project cultivation area decreases by 10%	1.37	11.4%	-10.6	-10.6	-0.1

EIRR = economic internal rate of return; ENPV = economic net present value; OER = operating expense ratio; SI = sensitivity indicator (the ratio that compares percentage change in ENPV with percentage change in a variable); SV = switching value (the percentage change in a variable sufficient to reduce ENPV to zero)

Annex 1 – Economic Resources Flow Statements

Table A1.1: Economic Resources Flow Statement (Without-Project Scenario)

	Unit	2009 Yr 1	2010 Yr 2	2011 Yr 3	2012 Yr 4	2013 Yr 5	2014 Yr 6	2015 Yr 7	2016 Yr 8	2017 Yr 9	2019 Yr 11	2020 Yr 12	2023 Yr 15	2024 Yr 16	2025 Yr 17	2030 Yr 22	2034 Yr 26
Construction phase	flag	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-
Operation phase	flag	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1
WITHOUT-PROJECT SCENARIO																	
Irrigation Benefits (Paddy)																	
Income																	
Paddy																	
Total income	mil IDR																
DMI Benefits																	
Revenue																	
Raw water supply																	
PAM Jaya	mil m3	1,011	826	976	976	976	976	976	976	976	976	976	976	976	976	976	0
PDAM Kab/Kota	mil m3	280	229	271	271	271	271	271	271	271	271	271	271	271	271	271	0
Community	mil m3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0
Industry	mil m3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	mil m3	1,293	1,057	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249	1,249	0
Economic value of water																	
PAM Jaya	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257
PDAM Kab/Kota	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257
Community	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257
Industry	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257	257
PAM Jaya	mil IDR	259,372	212,082	250,604	250,604	250,604	250,604	250,604	250,604	250,604	250,604	250,604	250,604	250,604	250,604	250,604	0
PDAM Kab/Kota	mil IDR	71,869	58,766	69,440	69,440	69,440	69,440	69,440	69,440	69,440	69,440	69,440	69,440	69,440	69,440	69,440	0
Community	mil IDR	487	399	471	471	471	471	471	471	471	471	471	471	471	471	471	0
Industry	mil IDR	110	90	106	106	106	106	106	106	106	106	106	106	106	106	106	0
Total revenue	**mil IDR**	**331,838**	**271,336**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**320,621**	**0**

O&M Cost																	
Existing	mil IDR	0	0	0	339,850	339,850	339,850	339,850	339,850	339,850	339,850	339,850	339,850	339,850	339,850	339,850	0
Incremental	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total O&M cost	mil IDR	**0.0**	**0.0**	**0.0**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**339,850.1**	**0.0**
Capex																	
Road Map Management (L2501)	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Resource Development and Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rehabilitation of the WTC (L2500)	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rehabilitation of the WTC (L2501)	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Improved Land and Water Management (L2501)	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Support for Community- and NGO-driven Initiatives for In	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DED for Upgrading of Bandung Bulk Water Sources (L2501	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Protection	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Development and Implementation of River Basin Quality	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Program Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Program Management (L2501)	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Independent Monitoring and Evaluation (L2501)	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capex	mil IDR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total Costs	mil IDR	**0**	**0**	**0**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**339,850**	**0**
Net Economic Resources Flow	mil IDR	**331,838**	**271,336**	**320,621**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**-19,229**	**0**

Table A1.2: Economic Resources Flow Statement (With-Project Scenario)

	Unit	2009 Yr 1	2010 Yr 2	2011 Yr 3	2012 Yr 4	2013 Yr 5	2014 Yr 6	2015 Yr 7	2016 Yr 8	2017 Yr 9	2020 Yr 12	2025 Yr 17	2030 Yr 22	2034 Yr 26
Construction phase	flag	1	1	1	1	1	1	1	1	-	-	-	-	-
Operation phase	flag	-	-	-	1	1	1	1	1	1	1	1	1	1
WITH-PROJECT SCENARIO														
Irrigation Benefits														
Total Incremental Income	mil IDR	0	0	0	6,442	0	20,940	27,763	21,922	27,086	41,362	62,745	58,723	54,149
Incremental Farming Cost														
Labour	mil IDR	0	0	0	-3,112	0	-10,562	-14,003	-1,513	72	4,406	10,554	9,536	8,793
Land Processing	mil IDR	0	0	0	-703	0	-2,386	-3,163	-240	162	1,261	2,819	2,547	2,349
Planting and replanting	mil IDR	0	0	0	-454	0	-1,542	-2,044	-85	205	998	2,121	1,916	1,767
Maintenance	mil IDR	0	0	0	-420	0	-1,427	-1,892	-279	-97	401	1,108	1,001	923
Fertilization	mil IDR	0	0	0	-252	0	-855	-1,134	-360	-333	-260	-154	-139	-129
Pest control	mil IDR	0	0	0	-68	0	-229	-304	45	113	298	560	506	466
Harvesting, threshing and transporation	mil IDR	0	0	0	-1,215	0	-4,122	-5,466	-595	22	1,709	4,101	3,706	3,417
Material	mil IDR	0	0	0	-1,882	0	-6,385	-8,466	-2,367	-2,035	-1,118	196	177	163
Seed	mil IDR	0	0	0	-616	0	-2,092	-2,774	-1,005	-995	-963	-912	-824	-760
Fertilizer	mil IDR	0	0	0	-1,133	0	-3,844	-5,097	-1,239	-959	-188	910	823	759
Pesticides	mil IDR	0	0	0	-132	0	-449	-596	-124	-82	33	197	178	164
Agricultural services	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Lease land	mil IDR	0	0	0	-162	0	-550	-729	2,342	3,468	6,530	10,855	9,809	9,044
Rental tools	mil IDR	0	0	0	-365	0	-1,240	-1,644	-402	-313	-67	284	256	236
Fuel	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	mil IDR	0	0	0	-2,357	0	-8,000	-10,607	-4,268	-4,413	-4,789	-5,297	-4,786	-4,414
Total farming cost	mil IDR	**0.0**	**0.0**	**0.0**	**-9,760.2**	**0.0**	**-33,121.9**	**-43,914.9**	**-8,575.9**	**-5,256.4**	**3,846.1**	**16,786.5**	**15,168.3**	**13,986.8**
Net Incremental Income	mil IDR	**0.0**	**0.0**	**0.0**	**16,201.9**	**0.0**	**54,061.7**	**71,678.1**	**30,497.9**	**32,342.1**	**37,516.0**	**45,958.2**	**43,555.1**	**40,162.4**
DMI Benefits														
Revenue														
Raw water supply														
PAM Jaya	mil m3	1,011	826	976	976	976	1,039	1,004	1,006	1,016	1,016	1,174	1,332	1,332
PDAM Kab/Kota	mil m3	280	229	271	271	271	288	278	279	282	282	282	282	282
Community	mil m3	2	2	2	2	2	2	2	2	2	2	2	2	2
Industry	mil m3	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	mil m3	1,293	1,057	1,249	1,249	1,249	1,330	1,285	1,287	1,300	1,300	1,458	1,616	1,616

Economic value of water														
PAM Jaya	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
PDAM Kab/Kota	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
Community	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
Industry	IDR/m3	257	257	257	257	257	257	257	257	257	257	257	257	257
PAM Jaya	mil IDR	259,372	212,082	250,604	250,604	250,604	266,752	257,734	258,132	260,873	260,873	301,344	341,815	341,815
PDAM Kab/Kota	mil IDR	71,869	58,766	69,440	69,440	69,440	73,914	71,416	71,526	72,285	72,285	72,285	72,285	72,285
Community	mil IDR	487	399	471	471	471	501	484	485	490	490	490	490	490
Industry	mil IDR	110	90	106	106	106	113	109	109	110	110	110	110	110
Total revenue	**mil IDR**	**331,838**	**271,336**	**320,621**	**320,621**	**320,621**	**341,280**	**329,743**	**330,253**	**333,759**	**333,759**	**374,230**	**414,701**	**414,701**
O&M Cost														
Existing	mil IDR	0	0	0	307,447	307,447	307,447	307,447	307,447	307,447	307,447	307,447	307,447	0
Incremental	mil IDR	0	0	0	7,056	11,226	13,556	23,186	28,930	28,930	28,930	28,930	28,930	28,930
Total O&M cost	mil IDR	**0**	**0**	**0**	**314,503**	**318,673**	**321,003**	**330,633**	**336,378**	**336,378**	**336,378**	**336,378**	**336,378**	**28,930**
Capex														
Road Map Management (L2501)	mil IDR	0	2,884	3,381	3,255	2,814	2,873	0	539	0	0	0	0	0
Water Resource Development and Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Rehabilitation of the WTC (L2500)	mil IDR	0	3,872	3,178	1,852	23,099	13,262	77,213	52,496	0	0	0	0	0
Rehabilitation of the WTC (L2501)	mil IDR	0	7,791	8,011	5,012	16,385	9,421	45,612	22,100	0	0	0	0	0
Improved Land and Water Management (L2501)	mil IDR	1,106	15,008	7,442	0	0	0	0	1,426	0	0	0	0	0
Support for Community- and NGO-driven Initiatives for Im	mil IDR	0	1,303	7,135	11,855	9,417	675	0	0	0	0	0	0	0
DED for Upgrading of Bandung Bulk Water Sources (L2501	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Environmental Protection	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Development and Implementation of River Basin Quality I	mil IDR	0	0	0	0	0	2,182	7,057	0	0	0	0	0	0
Program Management	mil IDR	0	0	0	0	0	0	0	0	0	0	0	0	0
Program Management (L2501)	mil IDR	0	3,810	3,000	2,309	2,835	1,752	4,011	2,776	0	0	0	0	0
Independent Monitoring and Evaluation (L2501)	mil IDR	0	0	966	468	3,224	2,050	2,166	1,926	0	0	0	0	0
Total captial costs	mil IDR	**1,106**	**34,668**	**33,114**	**24,752**	**57,773**	**32,216**	**136,058**	**81,265**	**0**	**0**	**0**	**0**	**0**
Total Costs	mil IDR	**1,106**	**34,668**	**33,114**	**339,255**	**376,446**	**353,219**	**466,692**	**417,642**	**336,378**	**336,378**	**336,378**	**336,378**	**28,930**
Net Economic Resources Flow	mil IDR	**330,732**	**236,667**	**287,507**	**-2,432**	**-55,826**	**42,123**	**-65,270**	**-56,892**	**29,723**	**34,897**	**83,810**	**121,879**	**425,933**