



Report and Recommendation of the President to the Board of Directors

Project Number: 35182-043
August 2016

Proposed Loan Republic of Indonesia: Flood Management in Selected River Basins Sector Project

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 11 August 2016)

Currency unit – rupiah (Rp)

Rp1.00 = \$0.000076

\$1.00 = Rp13,129

ABBREVIATIONS

ADB	–	Asian Development Bank
AMDAL	–	<i>Analisa Mengenai Dampak Lingkungan</i> (environmental impact assessment)
CBFRM	–	community-based flood risk management
CPIU	–	central project implementation unit
DED	–	detailed engineering design
DGAIF	–	Directorate General of Agricultural Infrastructure and Facilities
DGWR	–	Directorate General of Water Resources
EARF	–	environmental assessment and review framework
FRM	–	flood risk management
FRMP	–	flood risk management plan
ha	–	hectare
IEE	–	initial environmental examination
IWRM	–	integrated water resource management
LAR	–	land acquisition and resettlement
MPWH	–	Ministry of Public Works and Housing
O&M	–	operation and maintenance
PAM	–	project administration manual
RBO	–	river basin management organization
RBT	–	river basin territory
Rencana	–	basin development plan
RPJMN	–	<i>Rencana Pembangunan Jangka Menengah Nasional</i> (National Medium Term Development Plan, 2015–2019)
SPWR	–	Strategic Plan for Water Resources, 2015–2019

NOTE

In this report, “\$” refers to US dollars.

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 35182-043	
Project Name	Flood Management in Selected River Basins Sector Project	Department /Division	SERD/SEER
Country	Indonesia	Executing Agency	Directorate General of Water Resources, MPWH
Borrower	Government of Indonesia		
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Agriculture, natural resources and rural development	Rural flood protection		108.70
		Total	108.70
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Adaptation (\$ million)	20.00
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	Climate Change impact on the Project	High
	Natural resources conservation		
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Organizational development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas		
5. Poverty Targeting		Location Impact	
Project directly targets poverty	No	Rural	High
		Urban	Medium
6. Risk Categorization:	Complex		
7. Safeguard Categorization	Environment: B Involuntary Resettlement: A Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		108.70	
Sovereign Sector loan: Ordinary capital resources		108.70	
Cofinancing		0.00	
None		0.00	
Counterpart		52.87	
Government		52.87	
Total		161.57	
9. Effective Development Cooperation			
Use of country procurement systems		No	
Use of country public financial management systems		Yes	

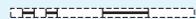
INDONESIA FLOOD MANAGEMENT IN SELECTED RIVER BASINS SECTOR PROJECT

128°00'E

129°00'E



0 5 10 20 30 40



Kilometers

3°00'S

6°20'S

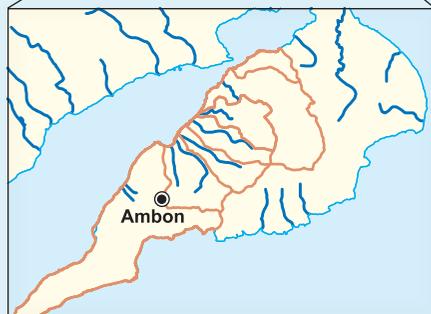
4°00'S

3°00'S

130°00'E

3°00'S

4°00'S



128°00'E

129°00'E

130°00'E



PACIFIC OCEAN

INDIAN OCEAN

Java Sea

Banda Sea

Arafura Sea

Jakarta

SUMATRA

JAVA

KALIMANTAN

SULAWESI

INDONESIA

PAPUA

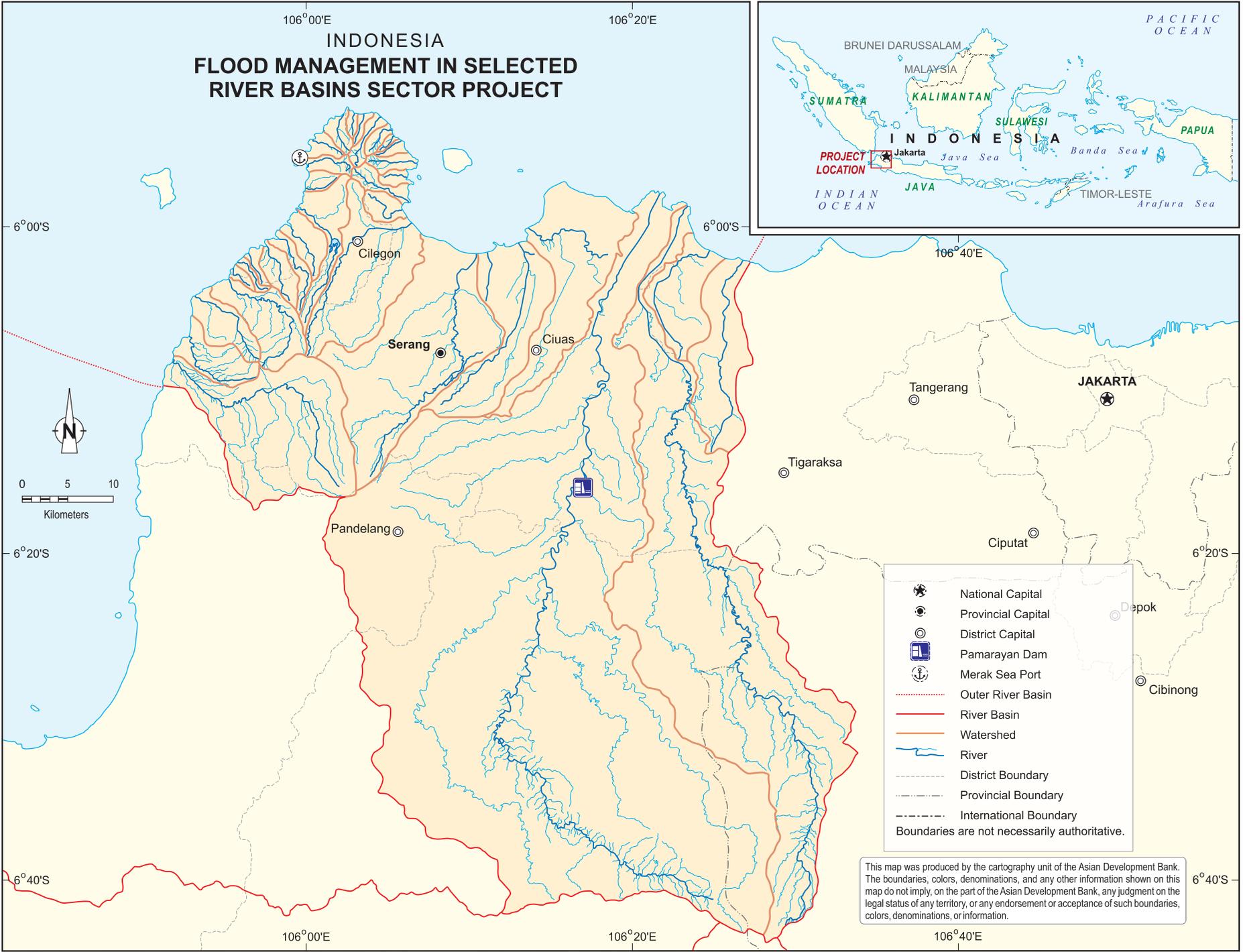
TIMOR-LESTE

PROJECT LOCATION

- National Capital
 - Provincial Capital
 - District Capital
 - Watershed
 - River
 - District Boundary
 - Provincial Boundary
 - International Boundary
- Boundaries are not necessarily authoritative.

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INDONESIA FLOOD MANAGEMENT IN SELECTED RIVER BASINS SECTOR PROJECT



- National Capital
 - Provincial Capital
 - District Capital
 - Pamarayan Dam
 - Merak Sea Port
 - Outer River Basin
 - River Basin
 - Watershed
 - River
 - District Boundary
 - Provincial Boundary
 - International Boundary
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I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republic of Indonesia for the Flood Management in Selected River Basins Sector Project.¹

2. The project will support the Government of Indonesia and river-based communities in better managing and mitigating flood risks.² The project has been designed as a sector loan to support the implementation of the Strategic Plan for Water Resources, 2015–2019 (SPWR) of the Ministry of Public Works and Housing (MPWH).³ The SPWR includes policy measures and priority investments in 63 river basin territories (RBTs) in Indonesia. The project will finance subprojects in the Cidanau–Ciujung–Cidurian (Banten province) and Ambon–Seram (Maluku province) RBTs. Project interventions will (i) enhance hydrometeorological data and analysis, management, and institutional coordination for managing flood risks; (ii) upgrade and develop flood protection infrastructure; (iii) improve watershed conditions to moderate runoff peaks and soil erosion; and (iv) prepare communities to manage floods. The project will promote effective flood risk management (FRM) by coupling infrastructure investment with supporting software measures. It will contribute to the achievement of the government's National Medium Term Development Plan, 2015–2019 (RPJMN) sector target to reduce the magnitude of economic and social damage due to floods.⁴

II. THE PROJECT

A. Rationale

3. Indonesia is highly prone to flooding due to its climate and topography.⁵ Flooding, which occurs annually in most of the country, has been increasing in frequency, causing as much as \$430 million in economic losses per year.⁶ During 2003–2015 average annual flood impacts have included: 1.58 million people per year affected; 223,000 homes completely or partially damaged; and 168,000 hectares (ha) of crops inundated.⁷ The floods sever vital transport arteries and often disrupt access to ports and airports, restricting the transfer of goods and services. In 2013, Ciujung river flooding affected 19,674 households, displaced 50,527 people, and disrupted traffic along the Jakarta–Merak toll road that connects Java to Sumatra island.⁸ Despite its location in a drier region, in 2013 Ambon suffered from flash floods resulting in the destruction of 59 homes and damage to 45 others; and 10 deaths, 5 missing persons, and 7,212 displaced people (footnote 8).

¹ The design and monitoring framework is in Appendix 1.

² The Asian Development Bank (ADB) provided project preparatory technical assistance for Preparing Flood Management in Selected River Basins (Phase II) (TA 7364).

³ Government of Indonesia, MPWH. 2015. *Rencana Strategis Sumber Daya Air, 2015–2019*. Jakarta. The plan calls for a reduction by 200,000 hectares (ha) of the flooded area nationwide by 2019.

⁴ Government of Indonesia, Ministry of National Development Planning, National Development Planning Agency (BAPPENAS). 2014. *Rencana Pembangunan Jangka Menengah Nasional, 2015–2019*. Jakarta.

⁵ Indonesia experiences two main types of flooding. Long-lasting river floods, which are often influenced by tides, generally occur in large islands with large river basins that have steep slopes and long, flat, and low floodplains (e.g., Irian, Java, Kalimantan, or Sumatra). Flash floods typically inundate small islands in eastern Indonesia that have small and steep mountainous river basins.

⁶ Centre for Research on the Epidemiology of Disasters - CRED. EM-DAT: The International Disaster Database. <http://www.emdat.be> (accessed April 2016).

⁷ Indonesian Disaster Data and Information Database. Disaster Data. <http://dibi.bnpb.go.id/data-bencana> (accessed April 2016).

⁸ National Disaster Management Authority. Geospasial. <http://geospasial.bnpb.go.id/> (accessed March 2016).

4. Flood impacts have worsened since 1980. Deforestation and inappropriate agricultural practices—which result in erosion and increased sediment loads in waterways⁹—are reducing the capacity of rivers to accommodate higher peak flows caused by intense rainfall. Expanding population combined with inadequate spatial planning and land management has led to substantial development in flood-prone areas, escalating flood damage to life and property. Urbanization, and particularly associated road construction and surfacing, reduces the vegetated area that would normally absorb rainwater, resulting in greater peak flood flows.¹⁰ The government agencies' ability to optimize flood management capacity and effectiveness is limited by weak hydrological data acquisition and management, and flood forecasting and climate risk modeling; and the lack of coordinated decision-making among government agencies. Insufficient investment in and neglected operation and maintenance (O&M) of flood protection infrastructure accentuate the adverse impacts of floods.¹¹ In the absence of appropriate awareness and preparedness, communities remain highly vulnerable to and at greater risk of loss of life and assets from more frequent and intense floods.

5. Climate change impacts include the increasing frequency of intense rainfall and rising sea levels, and are expected to further exacerbate flood risk.¹² The impacts of intense and frequent flood events combined with the lack of economic and social capital to manage flood risks further limit the ability of many river-based communities to escape poverty.

6. Water security is a central pillar of the RPJMN, which promotes FRM to reduce flood damage.¹³ Indonesia adopted the integrated water resource management (IWRM) approach, which is being promoted through (i) the establishment of river basin management organizations (RBOs),¹⁴ and (ii) the formulation of strategic basin plans as a prerequisite to basin development plans (Rencanas). The Rencanas form the basis for the public investment in water resource management with a horizon of 20 years, including flood management. Implementation of IWRM and participatory river basin management is still hampered by inadequate planning, investment, capacity, and coordination. The RBTs targeted by the project are not an exception. There is a growing need to integrate structural and nonstructural measures to create a holistic response to the flood challenge.

7. The project will support implementation of part of the SPWR calling for a \$3.06 billion investment in flood management.¹⁵ The Cidanau–Ciujung–Cidurian RBT (which is affected by

⁹ ADB. 2016. *Indonesia Country Water Assessment*. Manila. About 78 million ha in Indonesia are degraded.

¹⁰ Deltares et al. 2012. *Java Water Resources Strategic Study*. Report submitted to the World Bank. <http://citarum.org/citarum-knowledge/arsip-dokumen/dokumen-perencanaan/540-java-water-resources-strategy-study/file.html>. The study estimates that, at current trends, the urbanized area in Java will double within 30 years.

¹¹ Requirements to finance flood protection infrastructure for 2015–2019 are estimated at \$74.6 million in the Cidanau–Ciujung–Cidurian RBT and \$102.7 million in the Ambon–Seram RBT. During 2010–2014, only 60% of the planned investment was realized.

¹² Climate change is also expected to produce stronger and more frequent El Niño and La Niña events and will exacerbate floods and droughts, thereby leading to increased food and water insecurity.

¹³ FRM embraces a range of measures that address three key components: (i) managing flood hazard, (ii) minimizing exposure to flood hazard, and (iii) reducing the vulnerability of people and property exposed. Managing flood hazard involves physical modifications to water flow, such as river infrastructure works, and catchment management measures such as controls over forestry and agricultural practices. Managing exposure to floods involves property acquisition, land use zoning, building codes, planning development controls, and elevated building. Managing flood vulnerability involves nonstructural measures such as community awareness, flood forecasting and warning, preparedness, emergency response, and post-flood early recovery strategies. The FRM process allows these measures to be weighed against physical, social, and economic conditions; and addresses specific issues that characterize each RBT.

¹⁴ The central government is responsible for 63 RBTs, provincial agencies for 53, and district agencies for 15.

¹⁵ The SPWR calls for an overall investment of \$24.68 billion nationwide for water resources management.

river floods) and the Ambon–Seram RBT (which experiences flash floods)¹⁶ have been initially selected to demonstrate FRM in implementing the RPJMN. The investment will help the government accelerate implementation of Rencanas in selected RBTs, and provides (i) a long-term partnership between the Asian Development Bank (ADB) and the government for policy dialogue and capacity development, and (ii) the design of a future programmatic and systems based approach to flood risk management in Indonesia. The project's outputs and sector targets are clearly linked, and the criteria for the sector modality are met.¹⁷

8. The project builds on lessons from flood management assistance by ADB and development partners. The project design incorporates key recommendations based on these lessons, including (i) intensive consultations need to be conducted with local stakeholders during project preparation to address all problems and issues, (ii) the government should routinely collect and analyze flood-damage data, (iii) support is needed to design and develop sustainable long-term flood management concepts, and (iv) watershed management programs should be implemented to enhance the impact and sustainability of flood control works.¹⁸

9. The project is consistent with (i) the strategic priorities for the Midterm Review of Strategy 2020,¹⁹ and (ii) ADB's interim country partnership strategy, 2015 for Indonesia.²⁰ Agriculture and natural resources (including flood management) is a sector focus of the partnership strategy. The project is aligned with the ADB water operational plan, which identifies flood mitigation (as part of disaster risk management) as one of the two urgent challenges to be addressed in the IWRM approach.²¹ The project is also aligned with the ADB's plan for integrated disaster risk management as it will support the government and local communities to identify and better manage risks from natural hazards.²²

B. Impact and Outcome

10. The impact will be economic and social losses from flood events in selected river basins reduced. The outcome will be flood risks in selected river basins, including those in the Cidanau–Ciujung–Cidurian and Ambon–Seram RBTs, reduced through FRM.

C. Outputs

11. To achieve its expected outcome, the project will have the following outputs:

- (i) **Planning for flood risk management enhanced.** The project will introduce modern technology and install an expanded network of automatic equipment to better assess flood risks and formulate solutions. The project will support the

¹⁶ The Cidanau–Ciujung–Cidurian RBT covers an area of 4,125 square kilometers and lies mainly within Banten province, the westernmost province of Java. The Ambon–Seram RBT is located on the islands of Ambon and Seram in eastern Indonesia's Maluku province, and has an area of 18,625 square kilometers.

¹⁷ The required preconditions for the use of the sector lending modality—sector development plan, institutional capacity, and appropriate policy to implement the sector development plan—are all in place. The MPWH, as the executing agency, has the capacity to implement the sector development plan in terms of identification, selection, design, and implementation of subprojects. The sector development plan identified sector indicators that can be monitored and verified, including targets for cross-cutting and safeguard concerns.

¹⁸ ADB. 2007. *Completion Report: South Java Flood Control Sector Project in Indonesia*. Manila; and ADB. 2006. *Completion Report: North Java Flood Control Sector Project in Indonesia*. Manila.

¹⁹ ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

²⁰ ADB. 2015. *Interim Country Partnership Strategy: Indonesia, 2015*. Manila.

²¹ ADB. 2011. *Water Operational Plan, 2011–2020*. Manila.

²² ADB. 2014. *Operational Plan for Integrated Disaster Risk Management, 2014–2020*. Manila.

RBOs to prepare flood risk management plans (FRMPs) that integrate infrastructure investment with supporting software measures. This will be complemented by institutional strengthening, planning, and coordination in those provinces and districts that will use FRMPs in updating provincial, district, and/or city government spatial, midterm, and annual plans.²³

- (ii) **Land management improved and flood infrastructure upgraded.** This output will reduce flood hazards through a combination of physical interventions. The project will support RBOs to prepare detailed engineering designs (DEDs); meet environmental and social safeguards; conduct tendering and O&M planning; and implement infrastructure subprojects that are technically, socially, environmentally, and economically justified.²⁴ Flood control investments will be implemented in conjunction with programs that will reduce sediment transport. Communities in middle catchments will improve selected degraded land areas by implementing soil and water conservation measures to reduce soil erosion.²⁵
- (iii) **Capacity for community-based flood risk management enhanced.** To further improve flood resilience, community-based flood risk management (CBFRM) groups in the flood plains that benefit from the early warning system will be established, strengthened, and engaged. This involves raising the knowledge and understanding of the specific risks each community faces specific to their location, and the possible mitigation measures that might be available to prepare them. This will be focused on mitigating the adverse impacts of floods tailored to the specific nature and scale of the risk of each community in each location.
- (iv) **Policy, coordination, and capacity at national level improved.** To ensure effective policy and planning coordination, the project will support independent monitoring, evaluation, and strategic coordination under the National Steering Committee for Water Resources. A national strategy and a set of guidelines will be prepared to institutionalize the FRM approach. The project will support the executing and implementing agencies to strengthen the planning, implementation, and management capacities of the implementing agencies.

D. Investment and Financing Plans

12. The project is estimated to cost \$161.57 million (Table 1).

13. The government has requested a loan of \$108.7 million from ADB's ordinary capital resources to help finance the project. The loan will have a 17-year term, including a grace period of 8 years, a straight-line repayment method, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, a commitment charge of 0.15% per year (the interest and other charges during construction to be paid by the government and not capitalized in the loan), and such other terms and conditions set forth in the draft loan agreement.²⁶ Based on this, the average loan maturity is 12.75 years

²³ The FRMPs will be periodically revised to take into account asset and economic growth, updated hydrometeorological data, and changes in land use and policy. The FRMPs will also be used as a basis to update spatial, midterm, and annual plans by the local government; and issue related regulations (addressing land use, river corridors, solid waste management, spatial planning, and building).

²⁴ This comprises the (a) rehabilitation and upgrading of existing flood control structures; and (b) construction of new structures such as river dikes, spillways, coastal protection, retention basins, and check dams.

²⁵ The project will (a) empower farmers groups in the Cidanau–Ciujung–Cidurian RBT to adopt sustainable agriculture practices, including terracing and development of retention ponds; and (b) implement measures to stop landslides and thus reduce sediment yields in both RBTs.

²⁶ Loan Agreement (accessible from the list of linked documents in Appendix 2).

and there is no maturity premium payable to ADB. The financing plan is in Table 2.

Table 1: Project Investment Plan
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. Output 1: Enhanced planning for flood risk management	6.90
2. Output 2: Improved land management and upgraded flood infrastructure	120.46
3. Output 3: Enhanced capacity for community-based flood risk management	9.92
4. Output 4: Improved policy, coordination, and capacity at national level	4.40
Subtotal (A)	141.68
B. Contingencies^c	16.83
C. Financing Charges During Implementation^d	3.06
Total (A+B+C)	161.57

^a In 2016 prices.

^b Includes taxes and duties of \$13.08 million to be financed from government resources through tax exemptions.

^c Physical contingencies computed at 10% for civil works, 3% for consulting services, 8% for community-driven development activities, and 5% for land acquisition and resettlement. Price contingencies computed at 1.5% on foreign exchange costs and 6.7% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^d Includes interest and commitment charges. Interest during construction for the Asian Development Bank (ADB) loan has been computed at the 5-year forward London interbank offered rate plus a spread of 0.50%. Commitment charges for the Asian Development Bank loan are 0.15% per year to be charged on the undisbursed loan amount. Sources: Asian Development Bank and government staff estimates.

Table 2: Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (loan)	108.70	67.30
Government	52.87	32.70
Total	161.57	100.00

Source: Asian Development Bank estimates.

14. Consulting services, vehicles and equipment, coordination and socialization, community participation, and selected civil works packages will be funded by ADB, exclusive of taxes and duties. The government will fund taxes and duties, contingencies, land acquisition and resettlement (LAR), interest during construction, and recurrent costs.²⁷ Funds will be channeled to subnational agencies through ongranting arrangements.

E. Implementation Arrangements

15. The Directorate General of Water Resources (DGWR) under the MPWH will be the executing agency. A central project implementation unit will be established in the DGWR Directorate of River and Coast to provide technical guidance to the implementing agencies: the *Balai Besar Wilayah Sungai* (major river basin organization) Cidanau–Ciujung–Cidurian and the *Balai Wilayah Sungai* (river basin organization) Maluku. The Directorate of River and Coast will select and appraise structural subprojects in accordance with the criteria detailed in the project administration manual (PAM).²⁸ ADB will review subprojects on a selective basis with reference to the agreed criteria. The RBOs, together with the provincial land agencies, will prepare and implement the DED and LAR for structural subprojects. The river basin coordination bodies will provide strategic guidance and intersectoral coordination at the RBT level.²⁹

²⁷ The loan may finance local transportation and insurance costs.

²⁸ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

²⁹ The river basin coordination bodies for the Cidanau–Ciujung–Cidurian and Ambon–Seram RBTs were legalized in 2013 and 2012 through Minister of Public Works Decree Nos. 243/KPTS/M/2013 and 437/KPTS/M/2012.

16. The Ministry of Agriculture through the Directorate General of Agricultural Infrastructure and Facilities (DGAIF) will implement sustainable agriculture practices in the Cidanau–Ciujung–Cidurian RBT in cooperation with provincial and district agriculture agencies. A central project implementation unit (CPIU) has been established in DGAIF.

17. Under the overall guidance and responsibility of the CPIU under the Directorate General of Regional Development in the Ministry of Home Affairs, provincial and district planning agencies will ensure institutional strengthening, planning, and coordination of provincial and district disaster management, meteorology, public works, land, social, and forestry agencies. The provincial and district planning agencies will ensure that FRMPs are reflected in the sector spatial, midterm, and annual plans.

18. Through the Directorate of Water Resources and Irrigation under the National Development Planning Agency, a CPIU will be established to support the National Steering Committee for Water Resources in providing independent monitoring, evaluation, and strategic coordination of activities. The implementation arrangements are summarized in Table 3 and described in detail in the PAM.

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	November 2016–December 2022		
Estimated completion date	31 December 2022 (loan closing date: 30 June 2023)		
Management			
(i) Oversight body	NSCWR will provide policy direction. The committee, chaired by BAPPENAS, comprises (i) the DGWR director general as deputy chairman, (ii) the DWRI director as secretary, (iii) the DRC director as deputy secretary, and (iv) BAPPENAS, MPWH, MOA, and MOHA officials as members.		
(ii) Executing agency	DGWR		
(iii) Key implementing agencies	DRC, DGAIF, DGRD, and DWRI		
(iv) Implementation unit	The CPMU will be established under the DWRD under DGWR and will have 8 staff members. The CPIUs under DGAIF, DGRD, DRC, and DWRI will each have 8 staff members. The PIUs under BBWS Cidanau–Ciujung–Cidurian and BWS Maluku are already established. Provincial and district PIUs are being established.		
Procurement	NCB	2 contracts for core subprojects 40 for other subprojects	\$77,200,000
	Shopping	10 contracts	\$299,600
	CPP	653 contracts	\$18,324,000
Consulting services	QCBS (80:20)	2,579 person-months	\$14,842,000
	CQS	564 person-months	\$1,823,000
Advance contracting	The consulting services under DGWR, MOA, MOHA, and BAPPENAS and the NCB works for the core subproject have been proposed for advance contracting.		
Disbursement	Loan proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2015, as amended from time to time) and detailed arrangements agreed between the government and the ADB.		

ADB = Asian Development Bank, BAPPENAS = *Badan Perencanaan dan Pembangunan Nasional* (National Development Planning Agency), BBWS = *Balai Besar Wilayah Sungai* (major river basin organization), BWS = *Balai Wilayah Sungai* (river basin organization), CPP = community participation in procurement, CPIU = central project implementation unit, CPMU = central project management unit, CQS = consultant qualification selection, DGAIF = Directorate General of Agricultural Infrastructure and Facilities, DGRD = Directorate General of Regional Development, DGWR = Directorate General of Water Resources, DRC = Directorate of River and Coast, DWRD = Directorate of Water Resources Development, DWRI = Directorate of Water Resources and Irrigation, MOA = Ministry of Agriculture, MOHA = Ministry of Home Affairs, MPWH = Ministry of Public Works and Housing, NCB = national competitive bidding, NSCWR = National Steering Committee for Water Resources, PIU = project implementation unit, QCBS = quality- and cost-based selection.

Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

19. Technical due diligence included a comprehensive review of the hydrology, basin plans, and feasibility studies. For the core subproject,³⁰ site investigations and bathymetric surveys have been conducted to prepare the DED and cost estimates. During project preparation, the project team (i) considered a range of technical alternatives and their technical and economic viability; (ii) reviewed the rationale for the proposed design, specific components, and operational modes; (iii) deliberated ways to maximize the beneficiary areas and communities and minimize adverse environmental and social impacts; and (iv) optimized timescales for project implementation. The project inherently supports climate change adaptation because it will increase resilience to flood hazards; specific adaptation measures are included in the infrastructure designs, such as provision for increased flows in waterways. Furthermore, the investment program includes nonstructural components for climate resilience that will (i) assist communities in improving flood preparedness and resiliency; and (ii) assist the government in improving its policies and institutions, based on IWRM principles.³¹

20. The RBOs have the capacity to supervise and coordinate the construction of infrastructure. During project implementation, O&M manuals for the civil works financed by ADB will be developed in close collaboration with the Directorate of Operation and Maintenance under the DGWR to ensure sustainability of the investment. The official hydrological data management, flood modeling, and early warning system software suite developed by the Research Center for Water Resources under MPWH will be adopted to ensure consistency with DGWR's efforts to standardize systems nationwide.

21. Land and water management activities to be implemented in the Cidanau–Ciujung–Cidurian RBT by DGAIF are based on proven approaches. Implementation mechanisms and technical specifications are described in the Ministry of Agriculture guidelines. CBFMR activities will benefit from the Directorate General of Regional Development's coordination experience. Specific guidelines will be developed at the early stage of the project to provide guidance on selecting target communities and members of the CBFMR community groups.

B. Economic and Financial

22. Economic and financial analyses have been undertaken on the representative Ciujung subproject.³² The annual economic benefit of flood protection on the Ciujung river is estimated at \$6.19 million, with protection of buildings accounting for 93.9%. The value of protection of rice production has been excluded from the benefit stream (flood duration is less than 6 days).³³ The protection of the area under fish ponds accounts for 6.1% of total benefits. The economic internal rate of return of the subproject is estimated at 15.1%, higher than the assumed cutoff rate for economic viability of 12.0%. Sensitivity analysis indicates that the economic viability of the subproject is highly robust with respect to adverse movements in the values of key variables, and assumptions relating to asset values.

³⁰ The core subproject consists of the construction of dikes along 11 kilometers of the Ciujung river, complemented by the construction of spillways and a retention basin.

³¹ A climate risk vulnerability assessment has been undertaken for the Ciujung river basin and additional due diligence is planned for the future subprojects in the Cidanau–Ciujung–Cidurian and Ambon–Seram RBTs.

³² Economic and Financial Analysis (accessible from the list of linked documents in Appendix 2).

³³ It is assumed that an inundation of less than 6 days will not damage rice crops.

23. The economic analysis includes only the costs and benefits for structural measures. The costs and benefits of nonstructural interventions proposed under the project are difficult to quantify as they involve benefits and costs with nonmarket values. CBFMR measures tend to be low-cost activities with high levels of benefit. Such complementary nonstructural measures will significantly enhance the viability of subproject structural interventions. The financial analysis concluded that the required O&M budget level is assessed as highly affordable for DGWR, *Balai Besar Wilayah Sungai Cidanau–Ciujung–Cidurian*, and *Balai Wilayah Sungai Maluku*.

C. Governance

24. All ADB-financed procurement will be carried out in accordance with ADB Procurement Guidelines (2015, as amended from time to time). Project implementation, procurement, and financial management will be aligned with the government's standard operating procedures. The overall procurement classification for the project is medium risk (category medium).³⁴ A financial management assessment concluded that the pre-mitigation financial management risk level for the project is substantial due to the complex implementation arrangements and risks associated with internal controls, internal audit capabilities, and segregation of duties. There are shortfalls, such as the lack of experience with ADB project management for some implementing agencies, which will be addressed through training and support from the project management consultant.

25. ADB's Anticorruption Policy (1998, as amended to date) and ADB's Integrity Principles and Guidelines were explained to and discussed with the government and DGWR.³⁵ The specific policy requirements and supplementary measures are described in the PAM.

D. Poverty and Social

26. Mitigation and improved management of flood risks will benefit communities through (i) avoidance of property losses and reduction in casualties; (ii) increase in agricultural productivity and incomes through improved water management; and (iii) reduction of economic losses from livelihood disruption, and improvement of health and sanitation conditions. Land management and CBFMR activities will generate employment opportunities in the community. Civil society organizations will support community engagement. The project is classified as effective gender mainstreaming. Women will benefit from project interventions through increased engagement in (i) prioritizing flood risk reduction measures; (ii) implementing local disaster risk management activities; (iii) generating employment through small civil works and other project activities; and (iv) community disaster preparedness, including dissemination of flood warning.

E. Safeguards

27. **Environment.** The project is classified category B for the environment. The environmental assessment and review framework (EARF) includes procedures to ensure potential environmental impacts are avoided, reduced, and mitigated.³⁶ Potential adverse environmental impacts from the project are assessed to be temporary and insignificant, and can be readily mitigated. The EARF and initial environmental examination (IEE) for the Ciujung core subproject have been disclosed on ADB's website.³⁷ For future subprojects, government-approved environmental impact assessment (AMDAL) studies will be accepted as subproject

³⁴ Project Procurement Risk Assessment (accessible from the list of linked documents in Appendix 2).

³⁵ ADB. 2015. *Integrity Principles and Guidelines (2015)*. Manila.

³⁶ Environmental Assessment and Review Framework (accessible from the list of linked documents in Appendix 2).

³⁷ Initial Environmental Examination (accessible from the list of linked documents in Appendix 2).

environmental impact assessments (for category A)³⁸ or IEEs (for category B), provided they are prepared and finalized in consultation with ADB to ensure consistency with ADB Safeguard Policy Statement (2009) requirements, as specified in the EARF. Upon incorporation of ADB's comments to ensure that the AMDAL or the environmental management and/or monitoring plans meet Safeguard Policy Statement requirements, the English version of the AMDAL will be submitted to ADB and accepted as the IEE or the environmental impact assessment.

28. **Involuntary resettlement.** The project is classified category A for involuntary resettlement. Structural works will require LAR in rural and settlement areas. The resettlement framework guides the formulation and implementation of the resettlement plan for structural subprojects,³⁹ in compliance with the Safeguard Policy Statement and Government Law No. 2/2012 on Land Acquisition for the Development in the Public Interest and relevant implementing regulations. A resettlement plan was prepared and concurred by the government for the Cijung core subproject.⁴⁰ It will acquire 190.4 ha of land and will affect about 1,887 households (5,760 people), of which (i) 1,060 households are considered vulnerable, (ii) 93 households are to be physically relocated, and (iii) 1,208 households are to lose more than 10% of their productive assets. In accordance with the principles and implementation mechanisms described in the resettlement framework, the Banten province and Serang local government budgeted for the implementation of the social component of the resettlement program to complement the land acquisition activities and ensure better livelihood opportunities for affected and vulnerable groups. Local government commitment to fund and implement the social component of the resettlement program will be a prerequisite for ADB financing of structural subprojects to ensure that the project does not have the potential for significant adverse social impacts, particularly on vulnerable groups that may be unable to absorb such impacts.

29. **Indigenous peoples.** The project is classified category C (indigenous people do not live in the core subproject areas). As part of the selection criteria, future subprojects will exclude proposals that impact indigenous peoples.

F. Risks and Mitigating Measures

30. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.⁴¹ The overall benefits and impacts are expected to outweigh the risks and costs.

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
LAR activities for structural subprojects are delayed due to (i) a lack of engagement of subnational governments to support the social component of the LAR program, and (ii) untimely or lack of funding for compensation.	Provision of support for the social component of the LAR program by provincial and/or local governments will be confirmed during subproject selection as a prerequisite for investment. This will be translated into an agreement with DGWR that clearly stipulates roles and responsibilities of specific entities and funding commitments. The subnational planning agencies will coordinate with agencies involved in social programs to ensure timely preparation, implementation of activities, and budget allocation. The land agencies and appraiser will be involved early in the LAR process. The project team will ensure that DGWR's budget includes an allocation for compensation in accordance with appraiser estimates.
Allocation of resources for maintenance of	A long-term development plan for the hydrological units will be prepared as the basis for resource allocation by the BBWS Cidanau–Cijung–Cidurian and BWS Maluku to

³⁸ If a category A subproject is proposed, the categorization of the entire project will be changed to category A.

³⁹ Resettlement Framework (accessible from the list of linked documents in Appendix 2).

⁴⁰ Resettlement Plan: Cijung Core Subproject (accessible from the list of linked documents in Appendix 2).

⁴¹ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigating Measures
(i) equipment and information systems; and (ii) infrastructure is inadequate.	maintain the improved hydrometeorological equipment and information systems. As a loan covenant, DGWR will ensure that funds for maintenance of ADB financed infrastructure are allocated in line with O&M plans.
Risk management measures for financial management, anticorruption and procurement are not implemented.	The project team will coordinate with Indonesia's Supreme Audit Institution for any deviation from the agreed financial management and anticorruption risk management measures. Dedicated training will be provided by ADB and the project management consultant to strengthen staff capacity in the implementation units on financial management and procurement.
Community-based investments are unsustainable.	Under DGRD's overall supervision, the provincial and district planning agencies will ensure that community-based investments are continuously monitored. This will be reflected in the annual work plans of the involved local agencies. An asset and activity registry will be developed as part of the GIS-based monitoring system. CSO involvement will also help foster improved, longer-term community engagement.

ADB = Asian Development Bank, BBWS = *Balai Besar Wilayah Sungai* (major river basin organization), BWS = *Balai Wilayah Sungai* (river basin organization), CSO = civil society organization, DGRD = Directorate General of Regional Development, DGWR = Directorate General of Water Resources, GIS = geographic information system, LAR = land acquisition and resettlement.

Source: Asian Development Bank.

IV. ASSURANCES

31. The government has assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents.

32. The government has agreed with ADB on certain covenants for the project, which are set forth in the loan agreement.

V. RECOMMENDATION

33. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of \$108,700,000 to the Republic of Indonesia for the Flood Management in Selected River Basins Sector Project, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 17 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board.

Takehiko Nakao
President

31 August 2016

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with Economic and social losses from flood events reduced (Strategic Plan for Water Resources, 2015–2019) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Flood risks in selected river basins, including those in the Cidanau–Ciujung–Cidurian and Ambon–Seram RBTs, reduced through FRM	By 2022: a. About 19,000 ha of land with reduced flood risks (2016 baseline: 0 ha) b. About 22,000 households with reduced flood risks (2016 baseline: 0)	PPMS, project completion report	Insufficient government interagency coordination leads to ineffective and incoherent implementation of structural and nonphysical measures
Outputs 1. Planning for FRM enhanced	By 2019: 1a. Hydrometeorological stations installed (18 in the Cidanau–Ciujung–Cidurian RBT and 8 in the Ambon–Seram RBT) and repaired (17 in the Cidanau–Ciujung–Cidurian RBT and 28 in the Ambon–Seram RBT) (2016 baseline: Cidanau–Ciujung–Cidurian RBT: 15 water level gauges [8 damaged, 2 inactive], 23 rainfall stations [7 damaged]; and Ambon–Seram RBT: 16 water level gauges [9 damaged], 42 rainfall stations [13 damaged], 8 climate stations [6 damaged]) 1b. Flood models calibrated, flood hazard maps prepared, and flood early warning systems operational in the selected RBTs (2016 baseline: 0) 1c. FRMPs for the selected RBTs endorsed by RBT basin coordination forums (2016 baseline: 0) 1d. Gender-sensitive flood hazard vulnerability, risk, and emergency response mapped and hazard categories zoned in flood risk areas of selected RBTs (2016 baseline: 0) 1e. Guidelines for the linkage of flood hazard zoning to spatial plans, land use management regulations, and building regulations and development endorsed by provincial and district governments (2016 baseline: 0)	1a. –1b. RBO hydrology reports, quarterly project reports, PPMS 1c.–1d. River basin planning documents, quarterly project reports, PPMS 1e. Provincial and district planning documents, quarterly project reports, PPMS	Resources to maintain the improved hydrometeorological equipment, information systems not allocated as per requirements

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
<p>2. Land management improved and flood infrastructure upgraded</p> <p>3. Capacity for CBFMR enhanced</p> <p>4. Policy, coordination, and capacity at the national level improved</p>	<p>1f. Women account for at least 20% of those trained in flood risk assessment and analysis, CBFMR prioritization, and implementation of locally appropriate FRM measures (2016 baseline: 0)</p> <p>By 2021:</p> <p>2a. Flood protection infrastructure rehabilitated or upgraded as per FRMPs developed under 1c (2016 baseline: 0)</p> <p>2b. River O&M manual and plans for flood protection infrastructure endorsed by DGWR (2016 baseline: 0)</p> <p>2c. 246 farmers groups, including 10% women, trained on sustainable agricultural practices and watershed management (2016 baseline: 0)</p> <p>2d. 6,150 ha of land with improved management (2016 baseline: 0)</p> <p>By 2021:</p> <p>3a. Guidelines for CBFMR prepared (2016 baseline: 0)</p> <p>3b. 30 communities in the Ambon–Seram and Cidanau–Ciujung–Cidurian RBTs have access to information from flash flood localized early warning system (2016 baseline: 0)</p> <p>3c. CBFMR programs implemented^b (2016 baseline: 0)</p> <p>3d. At least 30% of those involved in the identification and design of community-level infrastructure and O&M are female; contingency plans are gender responsive (2016 baseline: 0)</p> <p>By 2021:</p> <p>4a. GIS-based M&E system established (2016 baseline: 0)</p> <p>4b. A national strategy and corresponding guidelines to institutionalize the FRM approach approved by the NSCWR and National Water Council (2016 baseline: 0)</p>	<p>1f. Quarterly project reports, PPMS</p> <p>2a. Construction reports, quarterly project reports, PPMS</p> <p>2b. River basin planning documents, quarterly project reports, PPMS</p> <p>2c.–2d. MOA reports, quarterly project reports, PPMS</p> <p>3a.–3d. MOHA reports, quarterly project reports, PPMS</p> <p>4a.–4b. BAPPENAS and DGWR reports, quarterly project reports</p>	<p>Government funding not made available for LAR</p> <p>Resource allocation to maintain infrastructure is inadequate</p> <p>Communities unwilling to take responsibility for O&M of infrastructure when project funding ends</p> <p>Ineffective cooperation between government agencies</p>

<p>Key Activities with Milestones</p> <p>1. Planning for flood risk management enhanced</p> <p>1.1 Improve hydrometeorological observations, data management, and processing (Q2 2017) [KNS]</p> <p>1.2 Develop and calibrate hydrological and flood models, and prepare flood maps (Q2 2017) [GCD]</p> <p>1.3 Prepare FRMPs for selected river basins (Q3 2017) [GCD, KNS]</p> <p>1.4 Prepare flood information bulletins, news, and activities jointly with BNPB (Q3 2017) [GEM]</p> <p>1.5 Establish localized flood early warning system, and communication system (Q4 2017) [GCD, KNS]</p> <p>1.6 Support institutional strengthening, planning, and coordination of provincial and district local disaster management, meteorology, public works, land, social, and forestry agencies (Q3 2019) [GCD, GEM]</p> <p>2. Land management improved and flood infrastructure upgraded</p> <p>2.1 Select, appraise, and prepare subproject summary reports for candidate subprojects (Q4 2017) [GCD]</p> <p>2.2 Prepare DEDs for the selected subprojects, including environment and social safeguards documents and tender documents (Q1 2018) [KNS]</p> <p>2.3 Implement LAR and civil works for candidate subprojects (Q3 2021) [GCD]</p> <p>2.4 Construct check dams and small retention ponds (Q1 2021)</p> <p>2.5 Prepare river O&M manual and plans (Q4 2017) [GCD]</p> <p>2.6 Prepare programs for soil and water conservation in village and agricultural lands (Q4 2017) [GCD, GEM]</p> <p>2.7 Implement watershed rehabilitation activities (Q2 2020) [GEM]</p> <p>3. Capacity for CBFMR enhanced</p> <p>3.1 Prepare CBFMR guidelines (Q2 2017) [GCD, GEM]</p> <p>3.2 Identify and establish CBFMR groups and provide capacity development (Q3 2017) [GCD, GEM]</p> <p>3.3 Formulate community-based measures to reduce flood risk (Q3 2017) [GEM]</p> <p>3.4 Prepare contingency plans and standard operation procedures (Q4 2017) [GEM]</p> <p>3.5 Support community participation in the design of community-based infrastructure (Q1 2018) [GEM]</p> <p>3.6 Supervise the construction of community-based infrastructure and prepare O&M plans (Q3 2021) [GEM]</p> <p>4. Policy, coordination, and capacity at the national level improved</p> <p>4.1 Prepare the M&E framework (Q1 2017) [GCD]</p> <p>4.2 Develop the GIS-based M&E system (Q2 2017) [GCD]</p> <p>4.3 Prepare the national strategy and guidelines to institutionalize the FRM approach (Q1 2018) [GCD]</p> <p>4.4 Provide technical capacity building for relevant agencies [GCD, GEM]</p> <p>4.5 Ensure coordination among project stakeholders [GEM]</p>
<p>Inputs</p> <p>Asian Development Bank: \$108.7 million (ordinary capital resources)</p> <p>Government: \$52.87 million</p>
<p>Assumptions for Partner Financing</p> <p>Not applicable.</p>

BAPPENAS = Badan Perencanaan dan Pembangunan Nasional (National Development Planning Agency), BNPB = *Badan Nasional Penanggulangan Bencana* (National Disaster Management Agency), CBFMR = community-based flood risk management, DED = detailed engineering design, DGWR = Directorate General of Water Resources, FRM = flood risk management, FRMP = flood risk management plan, GCD = governance and capacity development, GEM = gender equity and mainstreaming, GIS = geographic information system, ha = hectare, KNS = knowledge solutions, LAR = land acquisition and resettlement, M&E = monitoring and evaluation, MOA = Ministry of Agriculture, MOHA = Ministry of Home Affairs, NSCWR = National Steering Committee for Water Resources, O&M = operation and maintenance, PPMS = project performance management system, Q = quarter, RBO = river basin organization, RBT = river basin territory.

^a Government of Indonesia, Ministry of Public Works and Housing. 2015. *Rencana Strategis Sumber Daya Air, 2015–2019*. Jakarta.

^b Farmers groups will be formed based on geographic and activity type, and legally established through decrees. Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=35182-043-3>

1. Loan Agreement
2. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development
3. Project Administration Manual
4. Contribution to the ADB Results Framework
5. Development Coordination
6. Economic and Financial Analysis
7. Country Economic Indicators
8. Summary Poverty Reduction and Social Strategy
9. Gender Action Plan
10. Initial Environmental Examination: Ciujung Core Subproject
11. Environmental Assessment and Review Framework
12. Resettlement Plan: Ciujung Core Subproject
13. Resettlement Framework
14. Risk Assessment and Risk Management Plan

Supplementary Documents

15. Gender Analysis
16. Financial Management Assessment
17. Project Procurement Risk Assessment
18. Detailed Economic Analysis
19. Climate Risk Assessment and Management