ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 43220-014
April 2017

Proposed Results-Based Loans
Republic of Indonesia: Integrated Participatory Development and Management of Irrigation Program

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 30 March 2017)

Currency unit	–	rupiah (Rp)
Rp1.00	=	$0.0000751
$1.00	=	Rp13,311

ABBREVIATIONS

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
BPKP	–	Badan Pengawasan Keuangan dan Pembangunan (Financial and Development Supervisory Board)
DGWR	–	Directorate General of Water Resources
DLI	–	disbursement-linked indicator
ha	–	hectare
IAMIS	–	irrigation asset management information system
IFAD	–	International Fund for Agricultural Development
IIP	–	irrigation improvement program
M&E	–	monitoring and evaluation
MPWH	–	Ministry of Public Works and Housing
NBB	–	needs-based budgeting
O&M	–	operation and maintenance
PAP	–	program action plan
PSS	–	program safeguard system
RBL	–	results-based lending
RBO	–	river basin organization
WRA	–	water resources agency
WUA	–	water users association

NOTE

In this report, “$” refers to United States dollars.

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RESULTS-BASED PROGRAM AT A GLANCE

1. Basic Data

Project Number: 43220-014

Project Name	Integrated Participatory Development and Management of Irrigation Program	**Department /Division**	SERD/SEER
Country	Indonesia	**Executing Agency**	Directorate General of Water Resources
Borrower	Government of Indonesia		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Agriculture, natural resources and rural development**	Irrigation	500.00
	Total	**500.00**

3. Strategic Agenda

	Subcomponents
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns Natural resources conservation

Climate Change Information

Adaptation ($ million)	30.00
Climate Change impact on the Project	Medium

4. Drivers of Change

	Components
Governance and capacity development (GCD)	Institutional development
Partnerships (PAR)	International finance institutions (IFI) Official cofinancing

Gender Equity and Mainstreaming

Some gender elements (SGE) ✓

5. Poverty and SDG Targeting

Geographic Targeting	Yes
Household Targeting	No
SDG Targeting	Yes
SDG Goals	SDG2, SDG6, SDG9

Location Impact

Nation-wide	High

6. Risk Categorization: Complex

7. Safeguard Categorization

Environment: B **Involuntary Resettlement:** B **Indigenous Peoples:** B

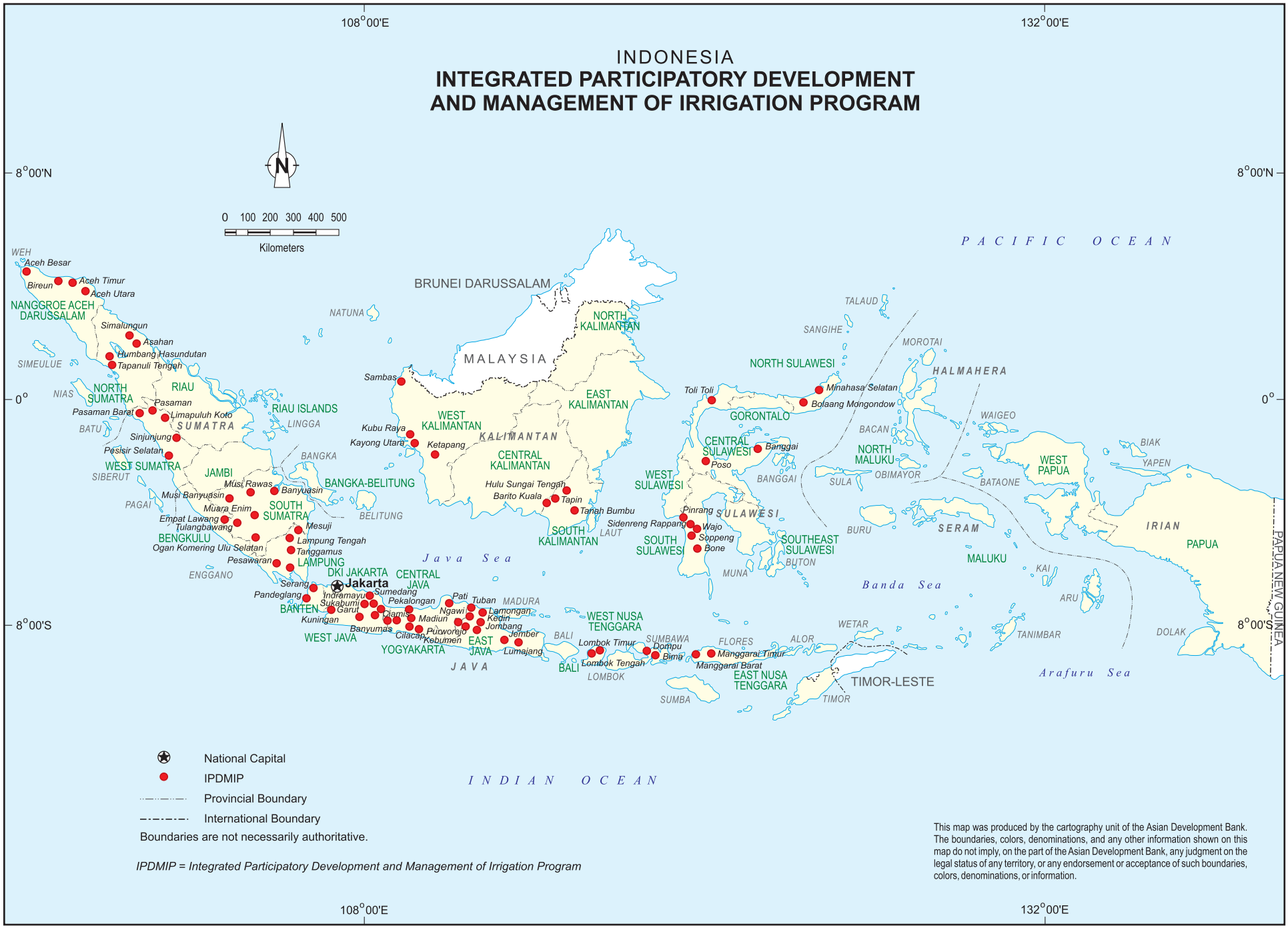
8. Financing

Modality and Sources	Amount ($ million)
ADB	**500.00**
Sovereign Results Based Lending (Regular Loan): Ordinary capital resources	500.00
Cofinancing	**128.00**
ASEAN Infrastructure Fund - Loan	100.00
World Bank - Loan	28.00
Counterpart	**1,051.00**
Government	1,051.00
Total	**1,679.00**

9. Effective Development Cooperation

Use of country procurement systems	Yes
Use of country public financial management systems	Yes

Source: Asian Development Bank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INDIAN OCEAN
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MALAYSIA
TIMOR-LESTE
PAPUA NEW GUINEA
SUMATRA
KALIMANTAN
SULAWESI
JAVA
BALI
LOMBOK
SUMBA
TIMOR
HALMAHERA
SERAM
IRIAN
PAPUA
MALUKU
NANGGROE ACEH DARUSSALAM
NORTH SUMATRA
RIAU
RIAU ISLANDS
WEST SUMATRA
JAMBI
SOUTH SUMATRA
BENGKULU
LAMPUNG
BANGKA-BELITUNG
DKI JAKARTA
Jakarta
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YOGYAKARTA
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WEST KALIMANTAN
CENTRAL KALIMANTAN
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WEST PAPUA
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Aceh Utara
Simalungun
Asahan
Humbang Hasundutan
Tapanuli Tengah
Pasaman
Pasaman Barat
Limapuluh Koto
Sinjunjung
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Kebumen
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Lumajang
Lamongan
Sambas
Kubu Raya
Kayong Utara
Ketapang
Hulu Sungai Tengah
Barito Kuala
Tapin
Tanah Bumbu
Toli Toli
Minahasa Selatan
Bolaang Mongondow
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Poso
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Soppeng
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Lombok Timur
Lombok Tengah
Dompu
Bima
Manggarai Timur
Manggarai Barat
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SIMEULUE
NIAS
BATU
SIBERUT
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ENGGANO
BELITUNG
LAUT
MADURA
SANGIHE
TALAUD
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BURU
WETAR
ALOR
TANIMBAR
KAI
ARU
DOLAK
SUMBAWA
FLORES
National Capital
IPDMIP
Provincial Boundary
International Boundary
Boundaries are not necessarily authoritative.
IPDMIP = Integrated Participatory Development and Management of Irrigation Program
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I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed loan from the ordinary capital resources of the Asian Development Bank (ADB) (A loan); and (ii) a proposed loan funded by the Association of Southeast Asian Nations (ASEAN) Infrastructure Fund (B loan), both to the Republic of Indonesia for the Integrated Participatory Development and Management of Irrigation Program.[1]

2. The program will support the Government of Indonesia in implementing its irrigation improvement program (IIP), 2015–2025,[2] which advances the overarching agenda of food security and rural poverty reduction through increased and improved water delivery.[3] The focus of the ADB support will be on improving irrigation system operation, maintenance, and water delivery to farmers. The program will finance a time slice of the government's IIP in 74 districts. The International Fund for Agricultural Development (IFAD) is providing parallel financing to the Ministry of Agriculture for improved delivery of agricultural services to maximize the benefits of the irrigation improvements.[4]

II. THE PROGRAM

A. Strategic Context

3. Boosting rural incomes and improving food security are significant concerns in Indonesia. Poverty is still predominantly rural, with poverty rates in rural areas 1.8 times higher than in urban areas.[5] Millions of people derive their incomes from food production, and food is the single largest expenditure item for the vast majority of households.[6] Despite positive trends in agricultural production, Indonesia still faces rising food imports, higher domestic food prices, and sporadic food shortages. Key agricultural products include rice, soybean, corn, fruit, and vegetables. With most of the rice coming from irrigated areas, water resources and irrigation management play an important role in the country's efforts to increase agricultural output.[7] However, water availability to the farm community is erratic in many areas. The Ministry of Public Works and Housing (MPWH)—in charge of irrigation infrastructure—estimates that only 55% of the nation's irrigation system is functioning at full capacity, limiting yields and reducing cropping intensity.[8] Irrigated agriculture is also sensitive to climate change.

4. Since 2006, the Directorate General of Water Resources (DGWR), MPWH, has introduced reforms to improve water delivery and operation and maintenance (O&M) services

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[1] The design and monitoring framework is in Appendix 1.

[2] The IIP is a subprogram of the Sector Plan for Water Resources from the Ministry of Public Works and Housing. It is aligned with the 2015–2025 strategy for irrigation. Government of Indonesia, MPWH. 2011. *Kebijakan Irigasi Tahun, 2015–2025*. Jakarta.

[3] The ADB provided project preparatory technical assistance for the Integrated Participatory Development and Management of Irrigation Project for Western and Eastern Indonesia Phase 1 (TA 8460-INO).

[4] IFAD financing of €94.56 million was approved in December 2015 and will be recorded as collaborative cofinancing.

[5] In 2016, 17.28 million people (14.0%) of people in rural areas fell below the rural poverty line of Rp350,420 per capita per month. Central Bureau of Statistics. 2016 Profile of Poverty in Indonesia. https://bps.go.id/website/pdf_publikasi/Penghitungan-dan-Analisis-Kemiskinan-Makro-Indonesia-Tahun-2016--.pdf (accessed 7 April 2017).

[6] In 2015, agriculture contributed to 14% of the gross domestic product, with an estimated 39 million people working in the sector. ADB. 2016. *Key Indicators for Asia and the Pacific 2016*. Manila.

[7] Surface irrigation is spread across about 48,000 irrigation systems covering 7.2 million hectares.

[8] Government of Indonesia, MPWH. 2014. *Irrigation Systems Rapid Assessment.* Jakarta.

and farmer's involvement by applying participatory irrigation management.[9] In 2010, the DGWR established a directorate dedicated to O&M for water resources. Asset management and needs-based budgeting (NBB) processes have been introduced to address the long-term sustainability of the infrastructure. In 2015, the DGWR institutionalized reforms introduced under the ADB-financed Participatory Irrigation Sector Project to improve sector performance.[10] This provides a robust regulatory framework for irrigation infrastructure, management, and O&M.

5. Since 2015, the implementation of the IIP has progressed with 834,000 hectares (ha) of irrigation systems rehabilitated, 460,000 ha of irrigation infrastructure inventoried and 161 irrigation commissions established nationwide. However, there are remaining gaps that constrain effective implementation of the IIP. Institutions and processes need strengthening, especially at the subnational level, to ensure sufficient budget allocation for routine O&M. To this end, a sound irrigation asset management registry and better planning at the scheme level are required, as a basis for NBB and performance benchmarking. Water delivery services also need improvements to provide the intended level of service and to cope with climate variability. Irrigation schemes need to be rehabilitated or upgraded to improve water efficiency and climate resilience. Improving irrigation services is necessary to increase rice yields and cropping intensity, provide farmers with an incentive to diversify from low- to high-value crops, increase rural incomes, and enhance food security. Better integration between irrigation and agriculture is needed to adapt to climate risks.

B. Program Rationale

6. The program is aligned with the government's long-term National Development Plan, 2005–2025[11] and National Medium-Term Development Plan, 2015–2019,[12] in which water and food security are priorities. To meet these national goals, the IIP calls for participatory irrigation management, better asset management systems, NBB, strengthening of water users associations (WUAs) and water resources agencies (WRAs), and the rehabilitation of 3.2 million ha of irrigation systems. The program is also aligned with the priorities of ADB's country partnership strategy, 2016–2019 for Indonesia.[13] The program is included in ADB's country operations business plan, 2017–2019 for Indonesia. It is aligned with ADB's Water Operational Plan, 2011–2020 and Operational Plan for Agriculture and Natural Resources, 2015–2020.[14]

7. This operation will be delivered using the results-based lending (RBL) modality because of (i) the strong government ownership of and commitment for the IIP; (ii) the nature of the program, which requires a results and system approach; (iii) the opportunity to leverage ADB financing by influencing key results under a large program; and (iv) the potential for harmonization among development partners through a mutual focus on results. RBL is also a suitable modality because it can (i) provide the most effective support by leveraging institutional

[9] Participatory irrigation management is a process that involves farmers and beneficiaries in the planning, design, construction, and operation and maintenance of irrigation systems.

[10] ADB. 2003. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to the Republic of Indonesia for the Participatory Irrigation Sector Project.* Manila.

[11] Government of Indonesia. 2005. *Rencana Pembangunan Jangka Panjang Nasional Tahun, 2005–2025*. Jakarta (National Long-term Development Plan).

[12] Government of Indonesia. 2015. *Rencana Pembangunan Jangka Menengah Nasional, 2015–2019*. Jakarta (National Medium-term Development Plan).

[13] ADB. 2016. *Country Partnership Strategy: Indonesia, 2016–2019: Towards a Higher, More Inclusive and Sustainable Growth Path.* Manila.

[14] ADB. 2011. *Water Operational Plan, 2011–2020.* Manila; and ADB. 2015. *Operational Plan for Agriculture and Natural Resources: Promoting Sustainable Food Security in Asia and the Pacific in 2015–2020.* Manila.

changes within the overall government-led program rather than specific areas as with other modalities;[15] (ii) enhance operational efficiency by shifting the focus to results rather than inputs; (iii) strengthen country systems on the basis of the outcome of technical, fiduciary, and program safeguard-system assessments; (iv) develop institutional capacity through the effective use of disbursement linked indicators (DLIs); and (v) enable ADB to disburse for results related to institutional strengthening, and capacity development to improve O&M and management.

8. The program incorporates the key recommendations on sustainability from the Participatory Irrigation Sector Project: (i) strengthening institutional frameworks and improving implementation processes; (ii) facilitating convergence between irrigation, livelihood, and agriculture interventions; (iii) incorporating irrigation development and management plans into regional plans; and (iv) enhancing the roles of communities and women in governance and service delivery.[16] The program will also introduce innovations: (i) upgrading the irrigation asset management information system (IAMIS) to a web-based and geospatial interface to facilitate data management; (ii) introducing aerial surveys to reduce costs and improve the quality of the asset registry; (iii) preparing water accounting using satellite data to predict water availability and adjust engineering design; (iv) pilot testing water productivity measurement as a future vehicle for policy making and improving water security; and (v) improving standards for engineering design to integrate infrastructure, agriculture, and climate resilience.

C. Program Scope

9. The RBL program will strengthen capacity to address institutional weaknesses, organizational fragmentation, and weak governance to improve O&M and management of irrigation systems. It will also improve water delivery to farmers by rehabilitating infrastructure. This combination of measures will improve rural resilience and boost water resource productivity. IFAD's support will complement RBL program by addressing underperforming extension services, poor access to financial services, and inefficiencies in the value-chain and cropping patterns that contribute to low farm incomes. The program scope is summarized in Table 1.

Table 1: Program Scope

Item	Broader Government Program	Results-Based Lending Program
Outcome	Sustainable and more productive irrigated agriculture in Indonesia	Sustainable and more productive irrigated agriculture in 74 districts
Key outputs	Rehabilitated or upgraded irrigation infrastructure; appropriate operation and maintenance; improved farmers' participation; and strengthened institutions.	Same elements as the broader government program, organized into three outputs: (i) systems and institutional capacity for sustainable irrigated agriculture strengthened; (ii) irrigation operation, maintenance, and management improved; and (iii) irrigation infrastructure improved.
Activity types	Rehabilitation or upgrading of irrigation infrastructure; improved asset management and needs-based budgeting; establishment of water users associations; and institutional strengthening of water resources agencies and irrigation commissions.	Upgrading of engineering guidelines; operationalization of irrigation commissions; improved asset management and needs-based budgeting through use of information system; operationalization of water users associations; institutional strengthening of water resources agencies; water accounting; and rehabilitation or upgrading of irrigation infrastructure.

[15] Under a project loan, it is estimated that the reach would be limited to around 330,000 ha, while under the RBL modality, improvement of performance will cover around 1.5 million ha, benefiting around 3 million farmers.

[16] ADB. 2014. *Completion Report: Participatory Irrigation Sector Project in Indonesia.* Manila; and Independent Evaluation Department. 2016. *Performance Evaluation Report: Participatory Irrigation Sector Project in Indonesia.* Manila: ADB.

Item	Broader Government Program	Results-Based Lending Program
Program expenditure	$9.94 billion	$1,679 million
Main financiers and the respective financing amounts	Government of Indonesia: $7.24 billion Development institutions: $2.70 billion	$1,051 million: Government of Indonesia (62.60%) $600 million: ADB (35.73%)[a] $28 million: World Bank (1.67%)[b]
Geographic coverage	National	74 districts[c]
Implementation period	2015–2025	2017–2021

ADB = Asian Development Bank, ASEAN = Association of Southeast Asian Nations.
[a] Including $100 million from the ASEAN Infrastructure Fund.
[b] Parallel financing provided under the ongoing Water Resources and Irrigation Sector Management Program II.
[c] The program is proposed to cover 74 districts across 16 provinces (Banten, Central Java, Central Sulawesi, East Java, East Nusa Tenggara, Lampung, Nanggroe Aceh Darussalam, North Sulawesi, North Sumatra, West Nusa Tenggara, South Kalimantan, South Sulawesi, South Sumatra, West Java, West Kalimantan, and West Sumatra).
Source: Asian Development Bank estimates.

D. Program Results

10. The RBL program's impacts will be improved rural incomes and livelihoods, and enhanced food security. The outcome will be sustainable and more productive irrigated agriculture in 74 districts, as evidenced by the enhanced performance of irrigation systems (DLI 1).[17] An additional indicator on increased crop yield will reflect the convergence with agricultural interventions by the Ministry of Agriculture and IFAD.[18] The program will emphasize strengthening of institutions and systems, including better tracking of irrigation system performance. Increased farmer participation will help improve water delivery. Improved asset management, NBB, and planning will improve O&M to ensure sustainability of the irrigation infrastructure. The outcome will be achieved through three outputs.

11. **Output 1: Systems and institutional capacity for sustainable irrigated agriculture strengthened.** Output 1 will support institutional measures that strengthen the planning, management, and delivery of irrigation systems; and improve the linkage between irrigation service delivery and agricultural development support. It will support the upgrading of (i) engineering guidelines for irrigation infrastructure to improve water efficiency and climate resilience, and (ii) planning guidelines to ensure that irrigation and agriculture development are integrated (DLI 2).[19] DLI 3 measures the operationalization of irrigation commissions, which will improve subnational institutional capacities for integrating agriculture and infrastructure development and O&M. Capitalizing on these strengthened institutions, this output will support the process to incorporate irrigation development and management plans into regional plans as captured by DLI 4.[20] A capacity development framework will be implemented and monitored (program action plan [PAP])[21] to strengthen the capacity of river basin organizations (RBOs), WRAs, and subnational planning agencies to address weaknesses in implementing government safeguards, procurement, financial management, gender mainstreaming, engineering, and irrigation O&M and management processes.

12. **Output 2: Irrigation operation, maintenance, and management improved.** Output 2

[17] The government's irrigation performance index measures improvements in infrastructure, water efficiency, cropping intensity, WUA participation, and other supporting factors required for sustainable and more productive agriculture.
[18] Cropping intensity is the number of times a crop is planted per year in a given agricultural area, while crop yield for rice refers to the weight of rice, at agreed standard moisture content, per unit of land area harvested for rice. Crop yield will depend more on Ministry of Agriculture interventions than on the program, so it has not been made a DLI.
[19] Improved guidelines will benefit the IIP nationwide with an investment estimated at $6.4 billion for infrastructure.
[20] The irrigation development and management plan is approved with appropriate budget allocations by the district or province parliament. It then becomes part of the development policy and plan for that district and/or province.
[21] Program Action Plan (accessible from the list of linked documents in Appendix 2).

focuses on measures aimed at enhancing irrigation sustainability and resilience at the scheme level. Having a better understanding of the condition of the irrigation network is critical to this effort. Toward that end, the program will upgrade and update the IAMIS to cover 2.5 million ha of irrigated area using aerial surveys of assets and remote sensing technologies (DLI 5). This will enable better linkages between asset management, sector budgeting, and planning. The participation of beneficiaries is central in improving asset management and water service delivery. Output 2 will enhance the role and participation of WUAs, including women and poor farmers, in the planning, design and construction, and operation of irrigation infrastructure to improve maintenance and management (DLI 6). Output 2 will also promote climate-resilient practices and provide training to farmers in water management.[22] It will ensure the convergence of irrigation, livelihood, and agriculture interventions in the technical, socioeconomic, and institutional profiling of irrigation schemes as a basis for investments (DLI 7).

13. **Output 3: Irrigation infrastructure improved.** The program will support infrastructure rehabilitation and/or upgrading. Rehabilitation will address design shortcomings, restore effective water service delivery, and improve water efficiency and climate resilience (DLI 8). To ensure the technical soundness of investments, the program will confirm the reliability of water sources through water accounting. The combination of participatory approaches and technology will lead to irrigation systems with improved efficiency that better serve the farm community.

Table 2: Disbursement-Linked Indicators

Indicator	Disbursement Allocated ($ million)	Share of Total ADB and AIF Financing (%)
Outcome: Sustainable and more productive irrigated agriculture in 74 districts		
DLI 1: By 2021, performance of irrigation systems in the program area improved by at least 15% from 2017 level	42.0	7.0
Output 1: Systems and institutional capacity for sustainable irrigated agriculture strengthened		
DLI 2: Planning and engineering guidelines for irrigation delivery systems are improved by 2019	36.0	6.0
DLI 3: Irrigation commissions operationalized to enhance institutional capacity for integration and coordination of agriculture and infrastructure development in 74 districts and 14 provinces by 2021	54.0	9.0
DLI 4: At least 74 district irrigation development and management plans endorsed by district heads by 2021	18.0	3.0
Output 2: Irrigation operation, maintenance, and management improved		
DLI 5: Irrigation asset management improved for 2.5 million hectares of irrigation systems by 2021	138.0 24.0	23.0 4.0
DLI 6: Effective management of tertiary irrigation systems through operationalizing at least 4,500 water users associations by 2021		
DLI 7: Improved assessments integrating agriculture and infrastructure development conducted for at least 719 priority schemes by 2021	36.0	6.0
Output 3: Irrigation infrastructure improved		
DLI 8: Rehabilitated irrigation infrastructure in program areas increased by 500,000 hectares by 2021	252.0	42.0
Total	**600.0**	**100.0**

ADB = Asian Development Bank, AIF = ASEAN Infrastructure Fund, ASEAN = Association of Southeast Asian Nations, DLI = disbursement-linked indicator.
Source: Asian Development Bank.

14. The RBL program has a robust and comprehensive results framework.[23] The DLIs

[22] IFAD will also promote climate-resilient practices and provide training to farmers in production, soil and crop management, improved planting methods, and improved pest and harvest management.
[23] Program Results Framework (accessible from the list of linked documents in Appendix 2).

comprise critical institutional output and outcome indicators to improve institutional and systemic capacity and irrigation infrastructure. The disbursement allocation is in Table 2.

15. Results monitoring and the measurement of outcome and output indicators (including DLIs) will rely on the reporting system of the DGWR. The Financial and Development Supervisory Board (BPKP) will be the independent verification agency. The BPKP is an internal auditor of the government and a separate agency from the executing and implementing agencies. It has a decentralized organizational structure and is mandated to verify government financial and development activities. The BPKP has significant experience working with externally funded programs, and is the independent verification agent for the World Bank's results-based Local Government and Decentralization Project.[24] The verification process is designed to strengthen government capacity in supporting the implementation of the IIP. ADB will conduct review missions to confirm the achievement of DLIs.

E. Expenditure Framework and Financing Plan

16. **Program expenditures.** The program will support IIP expenditures in 74 districts, which are estimated to be $1,679 million from 2017 to 2021 (Table 3).

Table 3: Summary of Program Expenditure Framework, 2017–2021
(in 2016 prices)

Item	**Amount** ($ million)	**Share of Total** (%)
Capital expenditures		
1. Infrastructure rehabilitation and upgrading	1,019	60.7
2. Operation and maintenance and management services	62	3.7
3. Planning and detailed engineering design	123	7.3
Recurrent costs		
4. Operation and maintenance expenditures	408	24.3
5. Staffing and operations	67	4.0
Total	**1,679**	**100.0**

Source: Asian Development Bank estimates based on the government's planning documents, including the national and sector medium-term plans, and other supporting sources.

Table 4: Program Financing Plan, 2017–2021

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank		
Ordinary capital resources (loan)	500	29.78
Government of Indonesia	1,051	62.60
ASEAN Infrastructure Fund (loan)	100	5.96
World Bank (loan)[a]	28	1.67
Total	**1,679**	**100.00**

ASEAN = Association of Southeast Asian Nations.
Note: Percentages may not total 100% because of rounding.
[a] Parallel financing provided through the Water Resources and Irrigation Sector Management Program (Phase II).
Source: Asian Development Bank estimates based on government planning documents.

17. **Program financing.** The government is expected to finance $1,051 million. The government has requested (i) a regular loan of $500 million from ADB's ordinary capital resources (A loan) and (ii) a loan of $100 million funded from the ASEAN Infrastructure Fund (B

[24] Through the Local Government and Decentralization Project approved in September 2014, the World Bank is supporting improvement of subnational governments' accountability and reporting of the specific allocation funds for the basic infrastructure, including irrigation. By 2018, the project will have national coverage.

loan) to help finance the IIP.[25] The A loan will have a 17.5-year term, including a grace period of 8 years; 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; and such other terms and conditions set forth in the draft loan agreement. Based on the straight-line method, the average maturity is 13 years, and there is no maturity premium payable to ADB. The B loan will have a 17.5-year term, including a grace period of 8 years; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; and such other terms and conditions set forth in the draft loan agreement. Based on the straight-line method, the average maturity is 13 years, and there is no maturity premium payable to ADB. The World Bank, through its Water Resources and Irrigation Sector Management Program, will provide $28 million. The financing plan is summarized in Table 4.

F. Capacity Development and Program Action Plan

18. The program will strengthen the capacity of agencies involved in the IIP, especially at the subnational level. A capacity development framework will be prepared, implemented, and monitored. The PAP includes key actions in specific technical areas, governance and fiduciary management, monitoring and evaluation (M&E), environment and social safeguards, and social inclusion and gender mainstreaming. The PAP will also strengthen government systems and institutions to manage performance and deliver results, notably in performance measurement, planning, supervisory and monitoring mechanisms, and addressing gaps in relevant knowledge. The government will procure consulting services to support the implementation of the PAP.

G. Implementation Arrangements

19. The executing agency will be the DGWR, MPWH. National RBOs and provincial and district WRAs—as implementing agencies—will deliver infrastructure investment and irrigation services, each according to its level of responsibility.[26] Under the overall guidance of the Ministry of Home Affairs, provincial and district planning agencies—as implementing agencies—will ensure institutional strengthening, planning, and internalization of O&M into five-year and annual plans.[27] The program completion date is on 31 December 2022.[28]

III. SUMMARY OF ASSESSMENTS

A. Program Technical Assessments

20. The program's soundness was assessed according to its relevance, justification, and adequacy.[29] The program is highly relevant to Indonesia's efforts to improve food security and foster rural income growth. The program is designed to improve irrigation service reliability and sustainability. Program interventions are well-justified, focusing on key results to implement the IIP. The program addresses inefficiencies in the delivery of irrigation services by strengthening WRAs and increasing beneficiary participation. To maximize the benefits brought by improved water delivery, the program will align irrigation efforts with agriculture development. The

[25] The assessment of the government budgets (including projected provisions for the program) confirmed the ability of the government to meet financing requirements and, in time, to ensure no program implementation delays.
[26] Irrigation schemes of less than 1,000 ha are the responsibility of districts; irrigation schemes above 1,000 ha and below 3,000 ha are managed by provinces, while schemes above 3,000 ha are managed by national RBOs.
[27] The National Development Planning Agency will provide strategic and policy guidance.
[28] To enable verification and reimbursement of 2021 achievements and financial closing of the loans.
[29] Program Soundness Assessment (accessible from the list of linked documents in Appendix 2).

program was screened for climate change risks and found to be at medium risk.[30] The climate risk and vulnerability assessment also identifies adaptation measures. Economic benefits include (i) improved farm income resulting from improved yield, cropping intensity, and agricultural development; and (ii) O&M cost savings owing to the improved IAMIS.[31] At the program level, the economic internal rate of return is 14%. Sensitivity analysis indicates that the program is robust against downside risks. Since 2011, the O&M expenditure for national irrigation schemes has consistently increased. For subnational irrigation schemes, the provision for O&M expenditure has been less predictable, the program will help the government to allocate the required funds for O&M. The IAMIS will bring substantial O&M cost savings and budget allocation efficiency for the government. Consequently, the government will be able to deliver more extensive irrigation maintenance services, with the same budget provision as set out under the IIP. To ensure long-term sustainability of the program, the government has agreed to allocate adequate funds for O&M of the irrigation schemes rehabilitated under the program.

21. The program is categorized *some gender elements*. The primary beneficiaries of the program will be local farming communities, including poor women farmers, and agricultural workers. The program will enhance participation and decision-making by women by (i) accelerating the capacity development of stakeholders, (ii) increasing the share of women in strategic positions, (iii) ensuring better social organization of WUAs, and (iv) strengthening institutions for pro-poor monitoring and gender mainstreaming in the irrigation sector.

B. Program Systems Assessments

22. **Monitoring and evaluation system.** The M&E system assessment found that the M&E system under the Directorate of Operation and Maintenance, DGWR—which covers infrastructure, O&M, WUA participation, institutional, and other aspects—is the most appropriate to monitor program implementation. However, reports from some districts with weaker capacities are delayed or incomplete. The program provides a unique opportunity to enhance and strengthen the M&E system by (i) upgrading the forms to ensure that all indicators presented in the result frameworks are captured, (ii) improving the capacity of agencies to comply with reporting requirements, (iii) preparing annual performance reports, and (iv) adopting the IAMIS as the M&E system in the long term. The DGWR will consolidate and submit periodic progress reports on the achievement of DLIs, PAP actions, and other performance indicators.

23. **Fiduciary systems.** The fiduciary assessment confirms that the government financial management, procurement, and anticorruption systems are adequate with some mitigation measures.[32] The financial management system assessment indicates a moderate fiduciary risk. While some financial management weaknesses and shortcomings have been identified, these can be effectively addressed through the proposed mitigation measures. The assessments found that (i) improvements were needed in planning and budgeting, (ii) further computerization was required for accounting and financial reporting, and (iii) the capacity of implementing agencies should be strengthened. The PAP includes the following risk mitigation measures: (i) provision of capacity building in financial management, supported by consultants; and (ii) preparation of consolidated unaudited financial statements at the program level.

24. The program will entail the procurement of civil works, goods, consulting services,

[30] Climate Risk Vulnerability Assessment (accessible from the list of linked documents in Appendix 2).
[31] Economic and Financial Analysis (accessible from the list of linked documents in Appendix 2).
[32] Program Fiduciary Systems Assessment (accessible from the list of linked documents in Appendix 2).

surveys, and individual facilitators. Except for large consulting services to support the implementation of the program, it is unlikely that packages will attract international bidders. Overall, the legislative framework for goods, works, and smaller consulting packages—where the national market can meet the demand—is largely adequate and incorporates internationally recognized principles of public procurement. The procurement assessment has identified the following risks: (i) low procurement capacity in some districts and provinces; (ii) procurement delays owing to insufficient planning and late release of government budgets; (iii) large numbers of bids being disqualified for not meeting technical, administrative and commercial terms, which leads to suboptimal competition; (iv) inconsistent procurement monitoring across all procuring entities; and (v) barriers for the participation of international contractors and consultants. The risks will be mitigated by (i) improving procurement reporting, (ii) ensuring that procurement actions are completed early each year, (iii) conducting procurement and probity audits throughout the program, (iv) procuring the large consulting services needed for the program under the ADB-funded Accelerating Infrastructure Delivery through Better Engineering Services Project,[33] outside the RBL program, and (v) conducting a value-for-money audit. The Guidelines to Prevent or Mitigate Fraud, Corruption, and Other Prohibited Activities in Results-Based Lending for Programs were explained to, and discussed with, the government.[34]

25. **Safeguard systems.** The program is classified *category B* for environment, involuntary resettlement, and indigenous peoples.[35] The program safeguard system (PSS) will apply. Potential environment impacts include those from rehabilitation of irrigation infrastructure, changes in river morphology, and reduced water quality. Those impacts are reversible and site-specific, and mitigation measures can be readily designed within the PSS. Rehabilitation works will occur on existing irrigation canals that already have right-of-way. The works will not require any significant relocation of households or acquisition of productive assets. They might only affect crops and land temporally and cause temporary loss of income. Severe impacts on indigenous peoples are not envisaged. The PSS assessment revealed that the PSS is broadly aligned with ADB's Safeguards Policy Statement (2009).[36] The main gaps identified are (i) weak screening and reporting; (ii) limited awareness of government's regulations on safeguards at the regional level because of rapid issuance of new regulations and guidance; and (iii) limited staff and budget for safeguards implementation. These gaps will be addressed through (i) upgrading of the screening procedures, and guidelines on environment assessment and management; (ii) improving reporting and monitoring processes and capacity; (iii) institutional strengthening of environment and social safeguards units in RBOs and WRAs; and (iv) improving compensation and assistance to meet ADB's Safeguard Policy Statement principles. Environment and social safeguard specialists and consultants will assist the government in implementing the PAP.

C. Integrated Risk Assessment and Mitigating Measures

26. An integrated risk assessment considered potential risks associated with (i) program results, (ii) fiduciary and safeguards systems, and (iii) the operating environment. Major risks and mitigating measures are summarized in Table 5. The assessment concludes that benefits

[33] ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Technical Assistance Loan to the Republic of Indonesia for the Accelerating Infrastructure Delivery through Better Engineering Services Project*. Manila.

[34] ADB. 2013. *Piloting Results-Based Lending for Programs*. Manila (Appendix 7).

[35] The program will exclude activities with (i) category A impact for environment, involuntary resettlement, and indigenous peoples; (ii) significant impacts on informal settlers residing on the DGWR's and WRAs' land; and (iii) significant physical relocation of affected persons.

[36] Program Safeguard Systems Assessment (accessible from the list of linked documents in Appendix 2).

and impacts are expected to outweigh the costs, with overall substantial program risk.

Table 5: Summary of Integrated Risk Assessment and Mitigating Measures

Risks	Ratings	Key Mitigating Measures
Results. Incorporation of the irrigation development management plan into five-year development plans may be delayed.	High	Raise awareness of key members of regional parliaments. Institutionalization of the irrigation development management plan to be mandatory.
Fiduciary. Some procedures for accounting and financial reporting have weaknesses. Unfamiliarity with standards for accrual accounting.	Moderate	Conduct financial management training to prepare financial reports on the program and improve financial management in general.
Procurement. Limited competition, weak documentation, and cost-driven selection for consultants affect quality.	Substantial	Implement measures to increase competition and improve quality, through better planning, capacity development, technical support, and audits.
Safeguards. Limited capacities lead to limited assessment and screening, and nonadherence to environmental and social safeguard regulations.	Substantial	Update the screening and reporting procedures to ensure that excluded activities are not accounted for, update the Ministry of Public Works and Housing guidance, and provide capacity development.
Operating environment. Complex and prolonged government approval procedures delay implementation.	Substantial	The National Steering Committee for Water Resources will coordinate the program. ADB will work with the government to streamline its procedures.
Overall RBL program risk	**Substantial**	

ADB = Asian Development Bank, RBL = results-based lending.
Note: Risk factors are assessed against two dimensions: (i) the likelihood that the risk will occur, and (ii) the impact of the risk on the outcome. Rating scale: low = low likelihood and low impact; moderate = substantial to high likelihood but low to moderate impact; substantial = low to moderate likelihood but substantial to high impact; high = high likelihood and high impact.
Source: Asian Development Bank.

IV. ASSURANCES

27. The government has agreed with ADB on certain covenants for the RBL program, which are set forth in the loan agreements.

V. RECOMMENDATION

28. I am satisfied that the proposed results-based loans would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(i) the A loan of $500,000,000 to the Republic of Indonesia for the Integrated Participatory Development and Management of Irrigation Program, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 17.5 years, including a grace period of 8 years; a commitment charge of 0.15% per year; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board; and

(ii) the B loan of $100,000,000 to the Republic of Indonesia for the Integrated Participatory Development and Management of Irrigation Program to be funded by the ASEAN Infrastructure Fund, on terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board.

Takehiko Nakao
President

17 April 2017

DESIGN AND MONITORING FRAMEWORK

Impacts the RBL Program is Aligned With			
Improved rural incomes and livelihoods, and enhanced food security (National Medium-Term Development Plan, 2015–2019 and National Long-Term Development Plan, 2005–2025)[a]			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting**	**Risks**
Outcome Sustainable and more productive irrigated agriculture in 74 districts	By 2021 a. Performance of irrigation systems in the program area improved by at least 15% from baseline level (2016 baseline: performance index 60%) [DLI 1] b. At least 50% of the district RP2I incorporated into five-year district, province, and national plans and budgets (2016 baseline: less than 5% of plans) c. Yields for rice increase by 18% for irrigation schemes supported by IFAD (2016 baseline: 4.03 tons/ha)	a. DOM–MIS reports, DGWR b. District and province reports, MOHA-SIPD and DGWR c. Crop Statistics Division reports, Ministry of Agriculture–Center for Agricultural Data and Information Systems	Incorporation of the irrigation development management plan into five-year development plans may be delayed. Gaps in coordination and delay in implementation between irrigation and agricultural interventions could put outcome achievement at risk.
Outputs 1. Systems and institutional capacity for sustainable irrigated agriculture strengthened	1a. Planning and engineering guidelines for irrigation delivery systems are improved by 2019 (2016 baseline: government guidelines on delivery systems need adjustment and refinement) [DLI 2] 1b. National competency certification system for irrigation planning, financing, and participatory management established and fully operational by 2019 (2016 baseline: no system) 1c. Irrigation commissions operationalized to enhance institutional capacity for integration and coordination of agriculture and infrastructure development in 74 districts and 14 provinces by 2021 (2016 baseline: 31 operationalized irrigation commissions) [DLI 3] [b] 1d. At least 74 RP2Is endorsed by district head by 2021 (2016 baseline: six plans endorsed) [DLI 4] 1e. Gender audits of planning and engineering guidelines conducted by 2018 (2016 baseline: planning and engineering guidelines not fully incorporating gender mainstreaming aspects) [PAP 15]	1a–f. Program reports, DGWR, MOHA	Complex and prolonged government approval procedures delay implementation. Political or other reasons delay endorsement of RP2Is.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	1f. Capacity development framework implemented and monitored to improve capacity of RBOs, WRAs, and planning agency staff by 2019 (2016 baseline: RBOs, WRAs, and planning agency staff need strengthening) [PAP 5]		
2. Irrigation operation, maintenance, and management improved	2a. Irrigation assets registered for 100% of the 2.5 million ha of irrigation systems by 2021 (2016 baseline: only 20% of national schemes assets are registered) [DLI 5]	2a. Irrigation asset management information system progress reports, DGWR	Variable capacities, especially at subnational level, (institutional and community) (i) pose risks to effective uptake, institutionalization, and implementation of regulatory frameworks and processes; (ii) may impede management and O&M activities; and (iii) may delay operationalization of WUAs and set back the assessment of priority schemes.
	2b. Effective participation of beneficiaries through operationalizing at least 4,500 WUAs by 2021(2016 baseline: no WUAs operationalized yet) [DLI 6]	2b. Program reports, DGWR, MOHA	
	2c. Number of women in the governing boards of WUAs increased to at least 20% by 2021 (2016 baseline: <10%)	2c. Program reports, MOHA	
	2d. Improved assessments integrating agriculture and infrastructure development conducted for at least 719 priority schemes by 2021 (2016 baseline: no assessments in line with expanded guidelines) [DLI 7]	2d. Program reports, DGWR, MOHA	
3. Irrigation infrastructure improved	3a. Water resources accounting using satellite technology to enable climate change adaptation planning for schemes of more than 200 ha in program area completed and validated by 2019 (2016 baseline: no additional schemes)	3a–b. Program reports, DGWR	Weak subnational capacities in some districts could lead to delays in infrastructure improvements and nonadherence to environmental and social safeguard regulations.
	3b. Detailed engineering designs prepared in line with DGWR technical standards completed for at least 800,000 ha in the program area by 2019 (2016 baseline: 45,000 ha)		
	3c. Rehabilitated irrigation infrastructure in program areas increased by 500,000 ha by 2021 (2016 baseline: 0 ha) [DLI 8]	3c. DOM–MIS and program reports, DGWR, MOHA	
	3d. Modernization process initiated for at least five irrigation schemes according to government technical standards by 2019 (2016 baseline: 0 schemes)	3d. Program reports, DGWR	
	3e. At least 30% of participants for planning and design of infrastructure consultations are women by 2021	3e. Program reports, DGWR, MOHA	
Key Program Actions			
1. Systems and institutional capacity for sustainable irrigated agriculture strengthened 1.1. Conduct district level intervention mapping and convergent planning with IFAD and other development			

partners (Q2 2017) [GEM]
1.2. Develop and implement a capacity development framework for WRA staff on social and environmental safeguards management, financial management, procurement, engineering and planning, and gender mainstreaming (Q4 2018) [GCD]
1.3. Update, issue, and disseminate key technical guidelines (Q2 2019) [KNS]
1.4. Establish staff and facilitator competency certification system (Q4 2017) [GCD]
1.5. Establish and strengthen irrigation commissions (Q4 2020) [GCD/GEM]
1.6. Develop, monitor, and evaluate (RP2I) at district, province, and RBO levels (Q4 2021) [GCD]
1.7. Ensure coordination among project stakeholders and ensure efficient project delivery (Q4 2021) [GCD]

2. Irrigation operation, maintenance, and management improved

2.1. Upgrade the irrigation asset management information system software (Q2 2017) [KNS]
2.2. Prepare assessments covering technical (infrastructure and agriculture), social, economic, climate change, and institutional aspects at the scheme level (Q4 2018) [GEM]
2.3. Collect and process aerial and field irrigation asset information for 2.5 million ha (Q4 2021) [KNS]
2.4. Develop irrigated agriculture management plans at the scheme level and district RP2I (Q4 2021) [GCD/GEM]
2.5. Conduct performance assessments of irrigation systems and address gaps in service plans (Q2 2017) [GCD/KNS]
2.6. Establish and strengthen WUAs (Q4 2021) [GCD/GEM]

3. Irrigation infrastructure improved

3.1. Prepare water accounting for large irrigation schemes using satellite technology (Q3 2019) [KNS]
3.2. Conduct diagnostic for modernization of irrigation system under water stress (Q4 2017) [KNS]
3.3. Select, evaluate, and design rehabilitation and upgrading of irrigation systems using the participatory approach according to government guidelines (Q3 2020) [KNS]
3.4. Rehabilitate, upgrade, and modernize irrigation systems (Q4 2021) [KNS]
3.5. Improve water measurement and promote water efficiency technology (Q4 2018) [KNS]

Financing Plan

Total program financing from 2017 to 2021: $1,679.0 million
Government of Indonesia: $1,051.0 million
Asian Development Bank: $500.0 million loan (ordinary capital resources)
ASEAN Infrastructure Fund: $100.0 million loan
World Bank: $28.0 million loan

Assumptions for Partner Financing

Outputs necessary to reach the outcome, but not administered by the Asian Development Bank, include those largely financed by the Government of Indonesia and IFAD:
1. Improved farm productivity and services, improved financial services and use of services, and improved market access and services (IFAD: €94.56 million in parallel financing)
2. Rehabilitation of tertiary canals (government)
3. Rehabilitation of irrigation systems; formation and strengthening of WUAs and irrigation commissions; and preparation of Social, Economic, Technical, and Institutional Profile; and RP2I (government and the World Bank)

The assumption is that these partners have sufficient resources, as planned, for their outputs to help achieve goals for irrigated agriculture and food security in Indonesia.

ASEAN = Association of Southeast Asian Nations, DGWR = Directorate General of Water Resources, DLI = disbursement-linked indicator, DOM = Directorate of Operation and Maintenance, GCD = governance and capacity development, GEM = gender equity mainstreaming, ha = hectare, IFAD = International Fund for Agricultural Development, KNS = knowledge solutions, MIS = management information system, MOHA = Ministry of Home Affairs, PAP = program action plan, Q = quarter, RBL = results-based loan, RBO = river basin organization, RP2I = *rencana pengembangan dan pengelolaan irigasi* (irrigation development and management plan), SIPD = *sistem informasi pembangunan daerah* (regional development information system), WRA = water resources agency, WUA = water users association.

[a] Government of Indonesia. 2015. *Rencana Pembangunan Jangka Menengah Nasional, 2015–2019*. Jakarta (National Medium-Term Development Plan); and Government of Indonesia. 2005. *Rencana Pembangunan Jangka Panjang Nasional Tahun, 2005–2025*. Jakarta (*Long-Term National Development Plan)*.

[b] Two provincial governments are not participating in the program.

Sources: Asian Development Bank; Government of Indonesia, Directorate General of Water Resources, Ministry of Public Works and Housing; and Ministry of Home Affairs.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=43220-014-3

1. Loan Agreement: Ordinary Capital Resources
2. Loan Agreement: ASEAN Infrastructure Fund
3. Country Economic Indicators
4. Summary Sector Assessment: Agriculture, Natural Resources, and Rural Development (Irrigation)
5. Program Soundness Assessment
6. Program Results Assessment
7. Program Results Framework
8. Program Expenditure and Financing Assessment
9. Program Monitoring and Evaluation System Assessment
10. Program Fiduciary Systems Assessment
11. Program Safeguard Systems Assessment
12. Integrated Risk Assessment and Mitigating Measures
13. Program Action Plan
14. Contribution to the ADB Results Framework
15. Development Coordination
16. Summary Poverty Reduction and Social Strategy
17. Program Implementation Document

Supplementary Documents

18. Program Social and Gender Assessment
19. Climate Risk Vulnerability Assessment
20. Economic and Financial Analysis
21. Detailed Safeguards Assessment
22. Sector Assessment: Agriculture, Natural Resources, and Rural Development (Irrigation)

DISBURSEMENT-LINKED INDICATORS, VERIFICATION PROTOCOLS, AND DISBURSEMENT SCHEDULE

Table A3.1: Disbursement-Linked Indicators

Results Indicators	Baseline Value	Baseline Year	Target Values of Results Indicators				
			2017	2018	2019	2020	2021
Outcome: Sustainable and more productive irrigated agriculture in 74 Districts							
DLI 1: By 2021, performance of irrigation systems in the program area improved by at least 15% from baseline level[a]	The performance index for national schemes in the program area was 60% No baseline for subnational schemes Reporting system non-functional in some districts	2016		Baseline data updated and reported for all schemes in 74 districts	Annual report on performance by scheme submitted from all participating agencies at national, provincial and district levels	Performance for 826 irrigation schemes in program area improved by at least 10% from 2017 baseline value	Performance for 826 irrigation schemes in program area improved by at least 15% from 2017 baseline value
Results area 1: Systems and institutional capacity for sustainable irrigated agriculture strengthened							
DLI 2: Planning and engineering guidelines for irrigation delivery systems improved by 2019	Government guidelines or regulations on delivery systems need adjustment and refinement	2016	5 guidelines updated,[b] of which 3 guidelines officially issued and disseminated	1 guideline updated[c] and 2 guidelines officially issued and disseminated	1 guideline officially issued and disseminated[d]		
DLI 3: Irrigation commission operationalized to enhance institutional capacity for integration and coordination of agriculture and infrastructure development in 74 districts and 14 provinces by 2021[e]	No updated performance criteria for assessing institutional capacity 31 operationalized irrigation commissions	2016	Irrigation commission performance indicators updated [f]	At least 45 district or province irrigation commissions are assessed as operationalized based on the updated performance indicators	At least 55 district or province irrigation commissions are assessed as operationalized based on the updated performance indicators	At least 65 district or province irrigation commissions are assessed as operationalized based on the updated performance indicators	At least 88 district or province irrigation commissions are assessed as operationalized based on the updated performance indicators
DLI 4: At least 74 District irrigation development and management plans (RP2I) endorsed by district head[g]	6 RP2Is endorsed in 2015 by district head for incorporation into five-year district plans and budgets	2016			12 RP2Is endorsed by district heads	50 RP2Is endorsed by district heads	74 RP2Is endorsed by district heads

Results Indicators	Baseline Value	Baseline Year	Target Values of Results Indicators				
			2017	2018	2019	2020	2021
Results area 2: Irrigation operation and maintenance, and management improved							
DLI 5: Irrigation asset management improved for 2.5 million hectares of irrigation systems by 2021[h]	The IAMIS software is outdated and cannot be used for planning and managing irrigation systems Only 20% of national schemes assets are registered	2016	IAMIS software has been upgraded to a web-based geospatial system Guidelines for field verification developed and approved Existing dataset on nationwide irrigation systems migrated to upgraded IAMIS	IAMIS has updated data and maps on at least 0.6 million hectares of irrigation systems, based on validated surveys and other existing data	IAMIS has updated data and maps on at least 1.2 million hectares of irrigation systems based on validated surveys and other existing data	IAMIS has updated data and maps on at least 1.8 million hectares of irrigation systems based on validated surveys and other existing data	IAMIS has updated data and maps on at least 2.5 million hectares of irrigation systems based on validated surveys and other existing data
DLI 6: Effective management of tertiary irrigation systems through operationalizing at least 4,500 WUAs by 2021[i]	No WUAs operationalized yet	2016	WUA performance indicators updated [j] Baseline survey conducted	The number of WUAs operationalized by the program is at least 3,000	The number of WUAs operationalized by the program is at least 4,000	The number of WUAs operationalized by the program is at least 4,500	
DLI 7: Improved assessments integrating agriculture and infrastructure development conducted for at least 719 priority schemes by 2021[k]	No SETIP/PSETK in line with expanded guidelines[l]	2016	SETIP/PSETK guidelines updated to integrate planning and development of agriculture and infrastructure At least 50 SETIPs/PSETK completed in line with the expanded requirements	At least 500 SETIPs/PSETK completed in line with the expanded requirements for integrated planning and development of agriculture and infrastructure	At least 719 SETIPs/PSETK completed in line with the expanded requirements for integrated planning and development of agriculture and infrastructure		

Results Indicators	Baseline Value	Baseline Year	Target Values of Results Indicators				
			2017	2018	2019	2020	2021
			for integrated planning and development of agriculture and infrastructure				
Results area 3: Irrigation infrastructure improved							
DLI 8: Rehabilitated irrigation infrastructure in program areas increased by 500,000 ha by 2021[m]	Zero hectare of rehabilitated or upgraded irrigation infrastructure as per MPWH technical standards	2016	At least 45,000 hectares of irrigation infrastructure rehabilitated or upgraded as per MPWH technical standards	At least 145,000 hectares of irrigation infrastructure rehabilitated or upgraded as per MPWH technical standards	At least 300,000 hectares of irrigation infrastructure rehabilitated or upgraded as per MPWH technical standards	At least 400,000 hectares of irrigation infrastructure rehabilitated or upgraded as per MPWH technical standards	At least 500,000 hectares of irrigation infrastructure rehabilitated or upgraded as per MPWH technical standards

DLI = disbursement-linked indicator; IAMIS = irrigation asset management information system; MPWH = Ministry of Public Works and Housing; RP2I = *rencana pengembangan dan pengelolaan irigasi* (irrigation development and management plan); SETIP = social, economic, technical and institutional profile; WUA = water user association.

[a] The irrigation performance index or *Indek Kinerja Sistem Irigasi* (IKSI) is calculated based on 6 criteria, with a possible total score of 100 as stipulated in the Ministry of Public Works and Housing (MPWH) regulation 12/2015. The 6 criteria are measured and weighted for every irrigation scheme as follows: (i) functioning infrastructure (45%); (ii) agriculture productivity (15%); (iii) supporting facilities for operations and maintenance (O&M) (10%); (iv) adequacy of human resources for O&M (15%); (v) adequacy of data and information (5%); and (vi) water user association participation (10%). Achievement of DLI 1 requires achieving outputs as well as strengthening the IKSI system so that baselines can be set. DLI 1 will cover irrigation schemes of more than 400 ha and 10 irrigation schemes with an area of less than 200 ha included in the selected 74 districts.

[b] Updated guidelines: (i) detailed engineering guidelines to incorporate adaptation for irrigation system management to increasing climate variability and change, climate proofing, water efficiency, mapping, and remote sensing; master planning and feasibility study methodology, construction management and technical specification and cost estimate standards; right of way management; hydro-mechanical works; (ii) participatory irrigation management or *Pengembangan dan Pengelolaan Sistem Irigasi Partisipatip* (PPISP) guidelines for water user associations (WUAs) and farmers empowerment; (iii) guidelines for preparation for operation an maintenance (PROM); (iv) social, economic, technical and institutional profile (SETIP) guidelines; (v) irrigated agriculture management plan (IAMP) guidelines. Officially issued: (i) SETIP guidelines; (ii) IAMP guidelines; (iii) guidelines for PROM.

[c] Updated guidelines: (i) decree for key performance indicators for RBOs and WRAs.Officially issued: (i) detailed engineering guidelines to incorporate adaptation for irrigation system management to increasing climate variability and change, climate proofing, water efficiency, mapping, and remote sensing; master planning and feasibility study methodology, construction management and technical specification and cost estimate standards; right of way management; hydro-mechanical works; (ii) participatory irrigation management or *Pengembangan dan Pengelolaan Sistem Irigasi Partisipatip* (PPISP) guidelines for WUAs and farmers empowerment.

[d] Officially issued: (i) decree for key performance indicators for river basin organizations (RBOs) and water resources agencies (WRAs).

[e] Strengthening institutional capacity for integration and coordination of agriculture and infrastructure development requires three steps: (i) irrigation commission performance indicators are updated; (ii) irrigation commissions meet the minimum score to be considered as operational; and (iii) the irrigation commission's performance is assessed against updated indicators in all target provinces and districts.

[f] The irrigation commission performance composite index includes: (i) establishment and legal status; (ii) staffing, job description, coordination and implementation of the work plan, documentations/reports and facilities; and (iii) annual operational budget.

[g] The RP2I, prepared with a needs-based budget, is endorsed by the head of district, a necessary step for the regional parliament's approval for incorporation into five-year sector plans and budgets.
[h] Improved irrigation asset management means: (i) irrigation asset management information system (IAMIS) software upgraded; (ii) existing dataset on irrigation systems migrated to upgraded IAMIS; (iii) surveys and remote sensing conducted on irrigation assets; (iv) survey data validated and entered into geospatial information systems; and (v) staff trained and appointed to use the IAMIS effectively.
[i] A given WUA is considered operationalized as per performance evaluation in line with updated guidelines.
[j] The WUA performance composite index includes: (i) establishment and legal status; (ii) operation of irrigation infrastructure and water allocation, (iii) management of tertiary canals and associated infrastructure.
[k] Improved assessments integrating agriculture and infrastructure development mean (i) SETIP is prepared for the irrigation scheme, and (ii) the assessment is conducted in line with the expanded requirements for integrated planning and development of agriculture and infrastructure.
[l] 763 irrigation schemes have completed SETIPs prepared in line with the current guidelines.
[m] Rehabilitated and upgraded infrastructure as per MPWH guidelines. The target excludes category A (involuntary resettlement, environment and indigenous people) interventions. For irrigation schemes that are crossing 2 districts – with one of them not a participating district – the downstream area hydraulically connected to the rehabilitated infrastructure will be accounted as functioning.

Sources: Asian Development Bank; Directorate General of Water Resources, Ministry of Public Works and Housing; and Ministry of Home Affairs.

Table A3.2: Verification Protocols

Disbursement-Linked Indicator	Definition and Description of Achievement	Information Source and Frequency	Verification Agency and Procedure
Outcome			
DLI 1: By 2021, performance of irrigation systems in the program area improved by at least 15% from baseline level	**Definition:** The irrigation performance index or *Indek Kinerja Sistem Irigasi* (IKSI) is calculated based on 6 criteria, with a possible total score of 100 as stipulated in the MPWH regulation 12/2015 or its update. The 6 criteria are measured and weighted for every irrigation scheme as follows: (i) functioning infrastructure (45%); (ii) agriculture productivity (15%); (iii) supporting facilities for O&M (10%); (iv) adequacy of human resources for O&M (15%); (v) adequacy of data and information (5%); (vi) water user association participation (10%). DGWR has a system for measuring this index that involves collection of field data in a series of forms. **Baseline:** The IKSI is measured for irrigation schemes under national authority in the program area. In 2015, the average IKSI for national schemes in the program area was 60%. There is no baseline for subnational schemes. "Program area" means irrigation schemes of more than 400 ha and 10 irrigation schemes with an area of less than 200 ha included in the selected 74 districts across 16 provinces. The definition of targets each year is geared towards strengthening the IKSI monitoring to be able to (a) set baseline data for 2017, (b) ensure the channels for regular data collection and annual report are well established and produce annual reports by 2018, and (c) start tracking performance index improvement in 2019, 2020, and 2021. This system will be combined with the IAMIS described in DLI 5, when complete. **Conditions for disbursement** are met if the target specified each year is achieved. **Partial disbursement**: The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if an improvement in IKSI for the program area is increased by only half the target set, then 50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.	DOM reporting supported by DILL, RBOs, WRAs and MOHA Frequency for reporting will be annual or semi-annual when necessary. However, monitoring may be as frequent as necessary.	Each year, the focal unit in DOM prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results each year in DOM where the database is housed. The IVA will verify the results by spot checks of the system at central level (where the data are housed), and at district, province and scheme level, where sampling and spot checks of the IKSI calculation and criteria will be undertaken. The IVA will refer to the verification guidelines prepared for the program. The IVA might require independent technical expertise, which could be drawn from a body outside the Government such as an Indonesian university or independent expert.

Disbursement-Linked Indicator	Definition and Description of Achievement	Information Source and Frequency	Verification Agency and Procedure
Output			
DLI 2. Planning and engineering guidelines for irrigation delivery systems are improved by 2019	**Definitions:** "Updated" means that guidelines are acceptable for the technical agencies. "Officially issued" means that the updated guidelines have been legalized by the technical agencies. "Disseminated" means that the updated guidelines have been distributed electronically and explained to national and subnational water resources agencies by the central government through 1 regional roadshow on year 2018. The purpose of this indicator is to ensure that program innovations and approaches become part of the institutional framework for irrigation systems O&M and management. **Conditions for disbursement** are met if the government issues the regulations or guidelines. **Partial disbursement**: The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made. The updated detailed engineering design guidelines weight for 50%, others are pro rata. Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.	DOM and DILL reporting supported by MOHA Frequency for reporting will be annual or semi-annual when necessary. However, monitoring may be as frequent as necessary.	The focal unit in DOM prepares an attestation that the DLI is met and attaches the relevant report. The IVA will refer to the verification guidelines prepared for the program.
DLI 3: Irrigation commissions operationalized to enhance institutional capacity for integration and coordination of agriculture and infrastructure development in 74 districts and 14 provinces by 2021	**Definition:** Irrigation commissions can be at both district and province level. An irrigation commission is considered to be "operationalized" based on the updated performance indicators. **Conditions for disbursement** are met if the number of commissions each year meeting the definition above is equal to or more than the target number of "operationalized" commissions for that year. **Partial disbursement:** The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if the number of commissions meeting the definition and conditions set above is equivalent to half of the target number for that year, then 50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means	DOM reporting based MOHA reporting Frequency for reporting will be annual. However, monitoring may be as frequent as necessary.	Each year, the focal unit in DOM prepares an attestation that the DLI is met and attaches the relevant report. The IVA will refer to the verification guidelines prepared for the program. The IVA will verify the results at district and province level through spot checks.

Disbursement-Linked Indicator	Definition and Description of Achievement	Information Source and Frequency	Verification Agency and Procedure
	that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.		
DLI 4: At least 74 district irrigation development and management plan (RP2I) endorsed by district heads	**Definitions:** District Irrigation Development and Management Plans or *Rencana Pengembangan dan Pengelolaan Irigasi (RP2I)* are the aggregation of available irrigation scheme level IAMPs covering national, province, and district levels in line with requirements set in MPWH regulation 12/2015 and its update. RP2Is cover irrigated agriculture development on a 5-year horizon and are updated every year. "Endorsed" means that the head of district government (*Bupati)* endorses the RP2I through a legal letter as a step for inclusion into the sector plan and budget of the district/province agencies. The budget should incorporate operations and maintenance needs. This process is called "internalization." **Conditions for disbursement** are met if the number of RP2I that have been endorsed by the district head. **Partial disbursement:** The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if the number of aggregated IAMPs meeting the definition set above is equivalent to 50% of the target number for that year, then 50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved, even if the achievement is a year or more late, as long as the achievement is during the program's duration.	DOM reporting supported by MOHA Frequency for reporting will be annual. However, monitoring may be as frequent as necessary.	Each year, the focal unit in DOM prepares an attestation that the DLI is met and attaches the relevant report. The IVA will refer to the verification guidelines prepared for the program. The IVA will verify the results at district level through spot checks.
DLI 5: Irrigation asset management improved for 2.5 million hectares of irrigation systems by 2021	**Definitions:** An "upgraded" IAMIS software means that the IAMIS software is web-based with geographic information system interface combining the functionalities of the previous Pengelolaan Aset Irigasi (PAI) and the *Rencana Pengembangan dan Pengelolaan Irrigasi* (RP2I) information systems in line with the requirements of the Ministry of Public Works and Housing regulation 23/2015. "Migration of existing data into the upgraded IAMIS" means that data collected for national schemes using the PAI format are converted into the new format and imported into the upgraded IAMIS.	DOM reporting supported by the DGWR data center, RBOs, WRAs and MOHA Frequency for reporting will be annual or semi-annual when necessary. However, monitoring may be as frequent as necessary.	Each year, the focal unit in DOM prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results at scheme through sampling and spot checks.

Disbursement-Linked Indicator	Definition and Description of Achievement	Information Source and Frequency	Verification Agency and Procedure
	"Updated data and maps for IAMIS" means that: (i) location of irrigation infrastructure (canal, headworks, diversion, turn out, drop, gate, aqueduct, drain) are digitalized and imported into the IAMIS: and (ii) dimensions and conditions of irrigation infrastructure have been validated through field check and are inputted in the IAMIS. The indicator relates first, to strengthening and upgrading the current IAMIS, and second, to the number of hectares of irrigation systems for which IAMIS data set has been thus updated. **Conditions for disbursement** are met if conditions specified in the DLI table each year are met. In the last four years, conditions for disbursement are met when digital geo-referenced information on irrigation infrastructure is inputted into the IAMIS and validated through field check that meets the definition above is equal to or more than the target number of hectares for that year. **Partial disbursement:** The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if the number of hectares meeting the definition and conditions set above is equivalent to 50% of the target number for that year, then 50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.		The IVA will refer to the verification guidelines prepared for the program. The IVA might require independent technical expertise, which could be drawn from a body outside the Government such as an Indonesian university or independent expert.
DLI 6: Effective management of tertiary irrigation systems through operationalizing at least 4,500 WUAs by 2021	**Definitions:** The DLI will be met when WUAs are considered operationalized as per performance evaluation in line with updated guidelines in line with the MPWH regulation 30/2015 and its update. "Program area" means irrigation schemes included in the selected 74 districts across 16 provinces. **Conditions for disbursement** are met if the number of WUAs each year meeting the definition above is equal to or more than the target number of WUAs for that year. **Partial disbursement**: The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if the number of WUAs meeting the definition and conditions set above is equivalent to 50% of the target number for that year, then	DOM reporting supported by RBOs, WRAs and MOHA Frequency for reporting will be annual. However, monitoring may be as frequent as necessary.	Each year, the focal unit in DOM prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results at scheme and community level through sampling and spot checks. The IVA will refer to the verification guidelines prepared for the program.

Disbursement-Linked Indicator	Definition and Description of Achievement	Information Source and Frequency	Verification Agency and Procedure
	50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.		The IVA might require independent technical expertise, which could be drawn from a body outside the Government such as an Indonesian university or independent expert.
DLI 7: Improved assessments integrating agriculture and infrastructure development conducted for at least 719 priority schemes by 2021	**Definitions:** The SETIP/PSETK will go beyond the usual assessments and be in line with the updated requirements to include environmental, livelihoods, agricultural, and institutional assessments. "Program area" means irrigation schemes included in the selected 74 districts across 16 provinces **Conditions for disbursement** are met if the number of SETIPs/PSETK as specified above for each year is equal to or more than the target number of assessments for that year. **Partial disbursement**: The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if the number of SETIPs/PSETK meeting the definition and conditions set above is equivalent to half the target number for that year, then 50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.	DOM reporting based on by RBOs, WRAs and MOHA reporting Frequency for reporting will be annual. However, monitoring may be as frequent as necessary.	Each year, the focal unit in MOHA prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results at scheme level through sampling and spot checks. The IVA will refer to the verification guidelines prepared for the program. The IVA might require independent technical expertise, which could be drawn from a body outside the Government such as an Indonesian university or independent expert.
DLI 8: Rehabilitated irrigation infrastructure in program areas increased by 500,000 ha by 2021	**Definitions:** The irrigation infrastructure in program areas that have been rehabilitated and upgraded as per MPWH technical standards includes all or parts of irrigation schemes, including headworks; primary, secondary and tertiary canals; associated structures (such as diversion, turn out, drop, gate, aqueduct, culvert, drains) and which function well, meaning that the irrigation infrastructure as a system delivers irrigation water to the target tertiary blocks.	DOM reporting based on DILL, RBOs, WRAs and MOHA reporting Frequency for reporting will be annual. However, monitoring may be as frequent as necessary.	Each year, the focal unit in DILL prepares an attestation that the DLI is met and attaches the relevant report. The IVA will verify the results at scheme level, where sampling and spot

Disbursement-Linked Indicator	Definition and Description of Achievement	Information Source and Frequency	Verification Agency and Procedure
	"Program area" means irrigation schemes included in the selected 74 districts across 16 provinces. For irrigation schemes that are crossing 2 districts – with one of them not a participating district – the downstream area hydraulically connected to the rehabilitated infrastructure will be accounted as functioning. **Conditions for disbursement** are met if the number of hectares served by rehabilitated/ upgraded irrigation infrastructure each year is equal to or more than the target number of hectares set for that year. **Partial disbursement:** The DLI is scalable and partial disbursement is allowed. If the target for each year is not met, then disbursement can be proportional to the increase made (e.g., if an increase in hectares meeting the definition and conditions set above is equivalent to 50% of the target hectares for that year, 50% of the planned disbursement for that year can be made). Disbursements are allowed for early or late achievement of the DLI. This means that the planned disbursement amount for a given year can be released when the set target is fully achieved even if the achievement is a year or more late, as long as the achievement is during the program's duration.		checks of the rehabilitation undertaken. The IVA will be provided with completion reports of rehabilitation works prepared by the RBOs and WRAs. The IVA will refer to the verification guidelines prepared for the program The IVA might require independent technical expertise, which could be drawn from a body outside the government such as an Indonesian university or independent expert

DGWR = Directorate General of Water Resources; DILL = Directorate of Irrigation and Low Land; DLI = disbursement-linked indicators; DOM = Directorate of Operation and Maintenance; IAMIS = irrigation asset management information system; IKSI = *Indek Kinerja Sistem Irigasi* (irrigation performance index); IVA = independent verification agency; MOHA = Ministry of Home Affairs; MPWH = Ministry of Public Works and Housing; O&M = operation and maintenance; RBO = river basin organization; RP2I = *rencana pengembangan dan pengelolaan irigasi* (irrigation development and management plan); SETIP = social, economic, technical and institutional profile; WRA = water resources agency.

Table A3.3: Disbursement Schedule[a]

($ million)

Indicator	Total ADB financing allocation	Share of total ADB financing (%)	2017	2018	2019	2020	2021	Total
DLI 1: By 2021, performance of irrigation systems in the program area improved by at least 15% from baseline level	42.0	7.0%	0.0	6.0	6.0	15.0	15.0	**42.0**
DLI 2. Planning and engineering guidelines for irrigation delivery systems are improved by 2019	36.0	6.0%	18.0	15.0	3.0	0.0	0.0	**36.0**
DLI 3: Irrigation Commissions operationalized to enhance institutional capacity for integration and coordination of agriculture and infrastructure development in 74 districts and 14 provinces by 2021	54.0	9.0%	6.0	24.0	12.0	6.0	6.0	**54.0**
DLI 4: At least 74 district irrigation management and development plans (RP2I) endorsed by district heads	18.0	3.0%	0.0	0.0	6.0	6.0	6.0	**18.0**
DLI 5: Irrigation asset management improved for 2.5 million hectares of irrigation systems by 2021	138.0	23.0%	18.0	30.0	30.0	30.0	30.0	**138.0**
DLI 6: Effective management of tertiary irrigation systems through operationalizing at least 4,500 WUAs by 2021	24.0	4.0%	6.0	6.0	6.0	6.0	0.0	**24.0**
DLI 7: Improved assessments integrating agriculture and infrastructure development conducted for at least 719 priority schemes by 2021	36.0	6.0%	12.0	12.0	12.0	0.0	0.0	**36.0**
DLI 8: Rehabilitated irrigation infrastructure in program areas increased by 500,000 ha by 2021	252.0	42.0%	78.0	57.0	63.0	39.0	15.0	**252.0**
TOTAL	**$600.0**	**100.0%**	**138**	**150**	**138**	**102**	**72**	**600.0**

ADB = Asian Development Bank, DLI = disbursement-linked indicators, ha = hectare, RP2I = *rencana pengembangan dan pengelolaan irigasi* (irrigation development and management plan, WUA = water user associations.

[a] Amounts will be disbursed on a pro-rata basis (83.3% OCR and 16.7% AIF).

Source: Asian Development Bank.