

SBF Project Completion Note

Indonesia: Strategic Irrigation Modernization and Urgent Rehabilitation

1. Project Information

Project ID:	P000060
Responsible department:	PSC1
Borrower:	Republic of Indonesia
Implementing Agency:	Ministry of Public Works, Indonesia
Financing type:	Sovereign-Backed Financing
Instrument type:	Loan
Member:	Indonesia
Sector:	Water
E&S category:	B
Overall rating:	Successful
Effectiveness Assessment:	Highly effective
Relevance Assessment:	Highly relevant
Efficiency Assessment:	Efficient
Sustainability Assessment:	Likely sustainable

2. Project Development Objectives

The Project Objective is to improve irrigation services and strengthen accountability of irrigation schemes management in selected areas.

3. Key Dates

Approval:	06/24/18	Signing:	07/11/18
Effective:	08/23/18	Restructured (if any):	05/16/22
Orig. Closing:	06/30/24	More Restructured dates (if any)	6/14/2024 and 6/30/2025
Rev. Closing:	06/30/25		

4. Financial Summary (US Dollar million)

Currency:	US Dollar		
Committed:	250.00	Cancelled:	4.50
Disbursed:	244.76	Undisbursed:	0.74

5. Overall rating

Overall rating:	Successful
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Executive summary of the completion note:

The Project has fully met all of its key objectives, including improving the efficiency of irrigation infrastructure and enhancing the accountability of the management system. In terms of measurable results, the Project has exceeded all targets set in the Project Objective Indicators. The Project introduces innovative approaches that are now being disseminated in other irrigation schemes beyond the Project areas. This includes the 'Irrigation Services Agreement (ISA)', which establishes agreed-upon service standards that irrigation operators must comply with, and 'Climate Smart

Agriculture (CSA)', which equips farmers with practical skills to increase their adaptive capacity and reduce carbon emissions in their farming practices. It underwent two (non-material) Project Changes during its implementation while maintaining its Project Objective, with key adjustments of: (i) May 16, 2022: adding seven irrigation schemes under the Project, (ii) June 14, 2024: 12-month extension of the loan closing dates, and (iii) June 30, 2025: a partial cancellation of the undisbursed loan proceeds amounting to USD 4,500,000. The Project marks another impactful joint operation by AIIB and the World Bank in the Indonesian water sector, following the Dam Operational Improvement and Safety Project II (2017 - 2024). The Project also lays the foundation for continuous AIIB support for Indonesian irrigation management, as reflected in ongoing discussions to mobilize similar financing for lowland and small-scale irrigation schemes under the country's 2025-2029 planning cycle.

Section I. Effectiveness

Effectiveness Assessment:	Highly effective
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Overall assessment of effectiveness:

The investments incurred under the Project have been effective in generating the expected results. Despite implementation delays during the Project's early stages (Section III. Efficiency discusses the nature, impact, and resolution of the delays), all targets set in the Project Objective Indicators were exceeded, and those in the Intermediate Results Indicators (IRI) were either met or exceeded. The target for the number of beneficiaries was exceeded by around 15 percent, surpassing the original target of 790,000 farmer households. The Project also empowered groups traditionally marginalized in irrigation management, i.e., farmers and women. The strengthening of farmers' participation was realized by building their organizational capacity and supporting the existing legal institutions and procedures, including Irrigation Commissions (IRI 2 and 10), farmer-embracing local planning documents (IRI 3 and 11), and Water User Associations (IRI 4, 6, 12, and 14). The Project also financed dedicated efforts to expand women's roles in irrigation and water management, resulting in the increased rate of women's participation in decision-making processes within Water Users Associations in the Project areas, i.e., an increase of 50 percent in areas of Component A (IRI 13) and an increase of 100 percent under Component B (IRI5). The Project addressed longstanding gender disparities in Indonesia's irrigation and agriculture sectors through a robust Gender Action Plan. The Project increased women's leadership by ensuring that over 90 percent of WUAFs included women, many of whom held leadership or financial roles. It also engaged 29 percent of women in Irrigation Commissions and supported 117 Women Farmers' Groups (KWTs) through training, inputs, and technologies. Small amounts of capital were provided to 32 business profiles of KWT in trading, processing, and services, with business turnover reported to have increased by approximately 80% (source: World Bank's Implementation Completion Report, December 2025). These results demonstrate that the Project boosted women's farming skills and improved their financial independence. Efforts to strengthen WUAs (IRI 4 and 12) demonstrated the highest overachievement (by over 300%), which, coupled with increased women's participation. Both are expected to optimize the extent and level of other Project benefits/achievements, namely, sustaining the improved performance of infrastructure (contributing to infrastructure's monitoring, operations, and maintenance) and enabling direct benefits for vulnerable groups, including farmers and women. The Project has demonstrated both efficiency and effectiveness in generating wider economic benefits, as shown by the post-project Economic Rate of Return of 34.2 percent and Benefit-to-Cost Ratio of 2.18 (source: World Bank's Implementation Completion Report, December 2025).

Project Objective Indicators

Monitoring end year: 2024

Indicator Name	Unit of Measure	Baseline	Actual (Current)	End Target
Area provided with new/improved irrigation or drainage services	Hectares	0	274,155	253,102
Percentage of crop intensity	paddy	180	216	200
Irrigation service agreements with clear allocation of responsibilities implemented	Number	0	13	9
Asset management systems with transparent budget allocation operational	Number	0	18	9

Comments:

Intermediate Result Indicators**Monitoring end year: 2024**

Component:

Urgent Rehabilitation of Irrigation and Drainage System

Indicator Name	Unit of Measure	Baseline	Actual (Current)	End Target
Annual performance report of irrigation service providers published	Number	0	11	8
Irrigation Commission (KOMIR) established and operational	Number	8	27	24
Participatory Irrigation Development and Management (PPISP) included in planning documents	Number	9	30	19
WUAs with trained members in decision making	Number	0	1207	390
WUAs with trained female members in decision making	Percentage	0	79	50
Number of WUAFs established and operational	Number	0	171	90
Establishment and operationalization of grievance mechanism for water users in delivery of irrigation services	Number	0	12	6
Number of farmer households provided with improved irrigation services	Number	0	515763	429000

Comments:

Component:

Strategic Modernization of Irrigation and Drainage System

Indicator Name	Unit of Measure	Baseline	Actual (Current)	End Target
Annual performance report of irrigation service providers published	Number	0	1	1
Irrigation Commission (KOMIR) established and operational	Number	1	3	3
Participatory Irrigation Development and Management (PPISP) included in planning documents	Number	1	4	2
WUAs with trained members in decision making	Number	0	1826	480
WUAs with trained female members in decision making	Percentage	0	100	50
Number of WUAFs established and operational	Number	0	182	160
Establishment and operationalization of grievance mechanism for water users in delivery of irrigation services	Number	0	1	1
Number of farmer households provided with improved irrigation services	Number	0	380968	362000

Comments:

Component:

Project Management

Indicator Name	Unit of Measure	Baseline	Actual (Current)	End Target

Comments:

Achievement of Project Results - Component {x}:

Section II. Relevance

Relevance Assessment:	Highly relevant
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Alignment with AIIB's Strategic Priorities:

The Project is highly relevant to AIIB's mission of fostering sustainable growth through climate-resilient infrastructures. The Project directly improves the livelihood and economic conditions of millions of people in farmers' households in the Project areas. Additionally, it establishes blueprints and pathways to generate a larger impact at the national scale by piloting Irrigation Service Agreements (ISA) and Climate Smart Agriculture (CSA), which have been gradually rolled out to areas beyond the Project's boundaries and utilizing funds outside of the Project (including national budgets). ISA, an initiative introduced by SIMURP, has captured policymakers' attention, leading to its dissemination. Having launched as an agriculture-oriented initiative of the government, CSA benefited from the Project funds that allowed the expansion of its focus (to include water-related aspects) and scope (across Indonesia). In terms of climate-resilient infrastructure, the Project minimized water loss in irrigation distribution networks (through rehabilitation of canals, gates, and related appurtenances), making them less susceptible to climate-driven water stresses. Lastly, the irrigation modernization undertaken by the Project is an example of 'Technology-enabled Infrastructures' embodied in AIIB's thematic priorities. Among other things, the Project established a system for collecting and processing satellite imagery and field-sensor data to assess weather and efficiently support agricultural production. This investment in digital infrastructure will enhance the extent and frequency of infrastructure monitoring (and asset management, in general), which traditionally relies on site visits and visual-based observations.

Alignment with Member policies, subnational planning and stakeholder needs, including changes to project objective and design:

The Project remains highly relevant to Indonesia's ongoing efforts to strengthen its water and food security, envisioned through three national mid-term planning cycles (2015-2019, 2020-2024, and 2025-2029). By rehabilitating over 270,000 hectares of irrigated areas, the Project directly contributes to achieving the national target of rehabilitating three million hectares of irrigated lands set in the 2015-2019 National Mid-term Development Plan (RPJMN) and, later carried over to, the 2020-2024 RPJMN. It also contributes to strategic priorities on food and water security set in both RPJMNs, namely the adoption of sustainable, water-efficient, and environmentally friendly approaches in agricultural production. The CSA approaches introduced by the Project includes empowering farmers to independently produce organic fertilizers and pesticides, thereby reducing the use of chemical-based agricultural inputs. In relation to the 2025-2029 RPJMN, the Project strengthens two (out of three) pillars envisioned by the RPJMN to accelerate the national growth towards a high-income status by 2045 (i.e., the pillars of water, energy, and food security). The Project's Result Framework also includes key outcome indicators adopted by the 2025-2029 RPJMN, namely the increase in the cropping intensity and irrigable areas. By completing infrastructure rehabilitation and initiating system-wide modernization, the Project ushered the country into taking the next step in irrigation management, which is optimizing production through technological augmentation, human resources improvement, and asset management.

Section III. Efficiency

Efficiency Assessment:	Efficient
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Achievement of efficiency, including implementation delays, cost overruns and savings:

The Project was completed within the estimated loan budget, eventually spending USD 244.76 million out of USD 250 million of AIIB's loan (after a partial loan cancellation of USD 4.50 million in June 2025). The Project faced delays during its early implementation stages, primarily due to the lengthy procurement process for project management and technical assistance contracts (to be undertaken by engineering and consultancy firms). This was resolved (see

'Lessons Learned' section) by mobilizing a team of individual consultants as interim technical assistance (for a year, since six months into the implementation), which subsequently ushered in an accelerated implementation in the years to come and culminated in the offsetting of the early delays (June 30, 2024). However, the implementation period was extended by one year as reflected by a (non-material) Project Change on June 14, 2024. This was not specifically due to inefficient implementation, yet by the growth of the Project's scope, during its implementation including (1) expansion of irrigation rehabilitation works in the Jatiluhur and Sei Ular Irrigation Schemes to repair damages brought by floods during the Project implementation period (especially those occurring February 2024), (2) expansion of analytical works to support national investment planning for irrigation under the RPJMN 2025-2029, this includes studies to prepare investments in lowland studies which AIIB has expressed its interest to be the downstream financier. The efficiency of the Project's implementation during its early stage could have been improved by providing additional attention to ensuring procurement readiness for key consultants (especially for project management and general technical assistance). The recruitment process for firms to assume the role of the Project Management Consultant and component-specific Technical Assistance Consultants was delayed for over a year, which slowed the commencement and implementation of civil works. The Project, however, was responsive in adopting an interim solution of swiftly hiring a team of individual consultants acting as a bridging assistance to the Project Implementation Units. Lastly, the Project has also been efficient and effective in generating wider economic benefits, as shown by the post-project Economic Rate of Return of 34.2 percent and Benefit-to-Cost Ratio of 2.18 (source: World Bank's Implementation Completion Report, December 2025).

Section IV. Sustainability

Sustainability Assessment:	Likely sustainable
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Implementation of project-specific Environmental and Social (E&S) instruments, such as the Environmental and Social Action Plan (ESAP), including the establishment and operation of a project-level Grievance Redress Mechanism:

All environmental and social-related risks had been addressed during the Project implementation. The Project faced challenges from the outset and throughout the implementation period, with shortcomings in dam safety compliance and delays in preparing environmental and social (E&S) documents and monitoring reports for some subprojects. Additionally, dedicated Project E&S focal points and the Contractor's Environmental and Social Management Plans (ESMPs) were absent during the early phase of implementation. The Project's safeguard performance and compliance improved as project management and technical assistance consultants were mobilized. It triggers a chain of actions that strengthen E&S risk assessments, mitigation planning, and implementation monitoring, including the mobilization of E&S experts at the central project management unit and local implementation units, the organization of regular E&S training sessions, the timely submission of E&S reports, etc. Such improvements also allow the addition of seven irrigation schemes to the Project through a non-material Project Change on May 16, 2022, with all site-specific E&S documents prepared during Project implementation. Towards the Project's closing, the World Bank declared the overall E&S performance and compliance 'Satisfactory'. E&S frameworks were fully prepared, including the Environmental and Social Management Framework (EMF), the Resettlement Policy Framework (RPF), and the Indigenous Peoples Framework. However, the Resettlement Plan and Indigenous Peoples Plan were not required, as no land acquisition or physical relocation occurred, and no indigenous people (IP) were present, or lands with which IP have a collective attachment, in any of the project locations.

The Project's Grievance Redress Mechanisms (GRM) have been robust and responsive, and a total of 873 redress reports have been recorded and resolved without escalation. The Project established a GRM at all implementation units, each with a designated person-in-charge to handle complaints. Most complaints were construction-related, such as utility damage, construction material spillage, air and dust pollution, clogged canals, and low irrigation flow during construction. All these were managed through proper documentation and agreements with affected people. All Project Implementation Units developed Gender-Based Violence Action Plans, and no grievance regarding Sexual

Exploitation and Abuse, Sexual Harassment, and Gender-based Violence was reported. Aside from the project-specific GRM, all PIUs (i.e., line ministries and river-basin organizations) have a built-in GRM mandated by national law that will continue to operate beyond the Project implementation period. The rehabilitation of irrigated fields has had positive social impacts, improving livelihoods and being widely welcomed throughout the Project areas.

Investment Sustainability (operational, financial/commercial, institutional):

Operational:

The improved efficiency of irrigation services is expected to be long-lasting due to the enhanced physical integrity of the infrastructure, improved in-field irrigation practices, enhanced financial and asset management, and strengthened institutional capacity. The design of rehabilitation works accounted for the long-term forecast of intensifying climate-driven hazards, which, in some locations, damaged canals, gates, and other physical infrastructures. The adaptive capacity of project beneficiaries against water shortages was also improved through the introduction of water-saving irrigation techniques (including the 'Alternate Wetting and Drying' approach) and promotion of drought-resistant crop varieties. Lastly, the modernization of irrigation through improved institutional arrangements (the introduction of Irrigation Service Agreements) and asset management (the dissemination of remote-sensing and field-sensor observations) has enhanced overall operations and maintenance (O&M), thereby sustaining and extending the benefits of the Project.

Financial:

The Project improves the efficiency of public spending on irrigation by facilitating accurate and need-based estimation of the annual O&M budget. Investments in field sensors and remote sensing observations have improved the accuracy and frequency of infrastructure monitoring. It enables the early detection of damages and malfunctions that require immediate repairs to avoid compounding insufficiencies and larger financial costs. This enables a targeted and needs-based O&M budget allocation, contributing to the sustained quality performance of irrigation infrastructures. Field-based technical data and asset management (including O&M budget) planning are now managed under an Electronic Asset and Performance Management System (e-PAKSI) and Irrigation Performance Dashboard (IKSI) established under the Project, both of which have been adopted to the Ministry of Public Works' daily operations.

Institutional:

The Project results in comprehensive institutional strengthening at every level of irrigation management, from policy to operational and community levels. At the strategic policy level, the Project supported the finalization and issuance of the Governmental Regulation No. 30/2024 on Water Resources Management, which institutionalized integrated, sustainable, and participatory water governance. At the operational level, the Project introduces ISA, which records the standards of irrigation services (e.g., volume allocation, schedule, irrigation method, etc.) that have been discussed, agreed upon, and signed by the irrigation operators (i.e., PIUs in river basin organizations) and farmers (i.e., WUAs) - and subsequently becomes the operational guidance for irrigation operators in providing irrigation services. ISA also provides irrigation operators with the legal framework to mobilize proportionate public budget to undertake O&M required to meet the agreed-upon service standards under ISA consistently. At the community level, the Project enhanced the participation of farmers and women in government-facing local organizations in irrigation management (i.e., Irrigation Commissions and Water User Associations) while also strengthening these organizations to enter ISAs and operate in the long term. With the ISA approach being gradually disseminated outside of the Project areas (including in separate rehabilitation works under the national budget), the Project shows early signs of bringing a systematic and lasting improvement to national irrigation management.

Any Outstanding issues and Follow-up actions, if applicable:

- (a) Discussions on the final audit report and counterpart-fund reconciliation between the Ministry of Finance and co-financiers (led by the World Bank) are expected by December 2025,
- (b) The dam safety reports for the Mrica Dam and Ameroro Dam are yet to be finalized. A Post-Closure Action Plan

(PCAP) was agreed upon at Project closing, under which independent dam safety assessments will be finalized by March 31, 2026, and any required remedial measures will be implemented by December 31, 2026 (funded by the national budget). The PCAP's implementation progress will be monitored and reported to the World Bank and AIIB on a semi-annual basis.

Lessons Learned**Lesson 1.**

Category	Project Design
What had AIIB planned would happen?	SIMURP initially seeks to improve the infrastructure maintenance planning by investing in innovative on-field monitoring tools (i.e., focused on sensors and gauges).
What happened during implementation?	The flexible project design of SIMURP allowed for the adoption of the latest developments in relevant technologies (including remote-sensing observations and small-scale data centers), which not only improved the maintenance regime but also enhanced infrastructure performance monitoring, allowed for performance-based O&M, and strengthened the overall asset management systems.
Why was there a difference between what was planned and what happened?	SIMURP's agility to harness the latest developments in remote monitoring throughout its implementation period.
What can AIIB do differently in the next project?	The adoption of remote sensing technology could be entrenched in the design of relevant future projects. SIMURP was informed of the technology's relevance for irrigation management only halfway through its implementation period, so it could only be mobilized in about half of SIMURP's project areas. Awareness of this technology's potential in improving the efficiency of O&M expenditure (by enabling remote monitoring and facilitating performance-based maintenance) should be built among key stakeholders (namely, the Ministry of Public Works as the executing agency and the Ministry of Finance as the borrower) early in the project preparation. The coupling of this technology with regular (online) surveys of farmers could be piloted in future projects to gain a holistic view (and as a cross-checking mechanism) on the condition and performance of irrigation infrastructures. Lastly, the technology could also be relevant for future projects seeking to operationalize remote operations of key infrastructures and mobilize private operators (through performance-based contracts) in undertaking infrastructures' O&M.

Lesson 2.

Category	Strategic External Environment
What had AIIB planned would happen?	The Result Framework fully captures key outcomes of the Project.
What happened during implementation?	Several results of activities designed and initiated in the middle of the Project implementation were not captured by the Result Framework, including

	investments in CSA, digital monitoring systems, remote control operations, and low-carbon farming.
Why was there a difference between what was planned and what happened?	The flexible Project design, while staying true to its core objective of improving infrastructure performance and service accountability, allows for the financing of activities beyond the original Project plan.
What can AIIB do differently in the next project?	The Project needs to periodically review (at least during the Project's Mid-term Review) the Result Framework developed during Project preparation and, if needed, undertake restructuring to maintain its relevance and comprehensiveness.

Lesson 3.

Category	Project Design
What had AIIB planned would happen?	Investment in WUAs' strengthening will improve their/farmers' participation in Irrigation Commissions, especially in the decision-making process for the planning of water allocation and O&M activities.
What happened during implementation?	Investment in WUAs resulted in greater ownership and participation by farmers than was anticipated during Project preparation. This was observable through voluntary adjustments to farmers' cropping schedules to align with the Project's construction plan, farmers' participation in small rehabilitation works (tertiary canals) through contracts with WUAs, voluntary supervision of civil works conducted around farmers' fields, improved inter-farmers conflict resolution within WUAs, etc.
Why was there a difference between what was planned and what happened?	Farmers enthusiastically welcome investments that actively embrace their participation and are prepared to bring added value, translated into Project benefits not foreseen during the Project preparation.
What can AIIB do differently in the next project?	Future Projects should fully appreciate the potential social capital that can be mobilized through the active involvement of farmers and their groups. They could allocate a larger portion of financing (i.e., a dedicated project component or sub-component) for activities that facilitate farmer participation and those aimed at engaging them in Project conceptualization. Also, the possibility of institutionalizing farmers' involvement in infrastructure O&M could be explored as the next phase of participatory irrigation management. Lastly, the contribution of farmers could be further enhanced by improving engagement strategies, which include early awareness-building campaigns, consultations, and strategy formulation that acknowledge the various socioeconomic conditions among farmers (i.e., smallholder and tenant farmers often have less incentive and time to engage in participatory-related activities)

Lesson 4.

Category	Construction and Preparations
What had AIIB planned would happen?	Immediate implementation of prioritized civil works with the start of project implementation.

What happened during implementation?	The first civil works could only be awarded approximately 18 months after the loan's effectiveness, which hampered the utilization of the Project funds. The Project implementation was assigned 'two red flags' for about two years within AIIB (consistent with the World Bank's reclassification of the implementation risks into 'Substantial' during the Project's Mid-term Review) due to the delayed contracting of civil works and fund disbursement.
Why was there a difference between what was planned and what happened?	The review process of detailed engineering designs (which are the basis for procuring civil works) was delayed substantially. The initial plan to mobilize engineering firms to conduct technical reviews and to serve as the project-level technical assistance consultant was delayed by organizational restructuring at PIUs and restrictions brought by the COVID-19 pandemic.
What can AIIB do differently in the next project?	The review of engineering designs for prioritized civil works should be completed by the time of loan approval or at the early stage of project implementation. Advanced procurement could be encouraged to swiftly mobilize key consultancy services (especially on aspects related to engineering design and safeguard). If needed, such early review could be conducted by a team of individual consultants (instead of relying on the mobilization of engineering firms, which can be time-consuming) to expedite the contracting process. SIMURP finally opted for the interim solution of hiring individual experts/reviewers around half a year into the project implementation. In future projects, this could have been done earlier if similar risks were identified.

Lesson 5.

Category	Project Design
What had AIIB planned would happen?	Immediate synchronization of work plans among PIUs (five national-level PIUs and twelve local-level PIUs) towards a diverging and coherent project-level work plan.
What happened during implementation?	The full synchronization of the overall work plan could not be effectively undertaken in the first year of implementation. For example, in some cases, the location of irrigation rehabilitation (under the Ministry of Public Works), farmer training (under the Ministry of Agriculture), and strengthening of irrigation commissions (under the Ministry of Home Affairs) do not overlap.
Why was there a difference between what was planned and what happened?	The delayed establishment of the Project's National Steering Committee, the high rate of staff turnover at PIUs (with an inefficient work handover process), reduces the frequency and intensity of coordination among PIUs.
What can AIIB do differently in the next project?	In the early phase of its implementation, the Project should not rely on establishing a designated Steering Committee to initiate cross-ministerial coordination and work synchronization. Instead, the Project should tap into the built-in coordination function of strategic ministries (i.e., the Ministry of National Development Planning or the Ministry of Finance). Also, project staff's on- and off-boarding procedures should be established early in the project implementation.

Lesson 6.

Category	Environmental and Social
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What had AIIB planned would happen?	Full compliance with safeguard standards on dam safety during the Project implementation.
What happened during implementation?	Full compliance was achieved on five (out of seven) dams on which the Project's irrigation areas depend for their water supply. This led to a post-project action plan to finalize the dam safety reports for the Mrica Dam and Ameroro Dam, by March 31 2026. Any investment needed to ensure the safety of these dams will be implemented by December 31, 2026 (funded by the national budget).
Why was there a difference between what was planned and what happened?	There was no dedicated dam safety focal point at the Project Management Unit or the World Bank in the first half of the Project implementation, which limited opportunities for early oversight. The Project was designed and implemented based on the assumption that another AIIB-WB Project in Indonesia, namely the Dam Operational Improvement and Safety Project II (DOISP, 2017-2023), will address all dam safety concerns under SIMURP. It was later concluded that DOISP only includes two (out of seven) irrigation-supplying dams under SIMURP. The dam safety requirements for five additional dams need to be independently met by SIMURP. As a result, the budget and expertise required to meet these requirements were only mobilized in the final years of the Project implementation.
What can AIIB do differently in the next project?	While there have been no concerns related to the dams irrigating the Project areas, the Project needs to be designed to align with the Bank's dam safety requirements since its inception. This should have been reflected in the development of the Project implementation plan (i.e., budgeting, staffing, and scheduling plans) during the Project preparation. In cases where opportunities exist to meet these requirements through related initiatives (e.g., ongoing government programs or another Bank-funded program), regular and closer checks of cross-project dependencies are necessary to ensure that such opportunities can be materialized during Project implementation.

Lesson 7.

Category	Project Design
What had AIIB planned would happen?	Irrigation modernization would be delivered efficiently if irrigation rehabilitation (civil works) is completed before investing in institutional development, digital innovations, and participatory irrigation management.
What happened during implementation?	The delay in infrastructure investments, driven by the lengthy engineering design process, late consultant mobilization, and insufficient flood-risk planning, slowed the implementation of civil works. This has partially disrupted the flow of institutional and participatory strengthening efforts, as they require a fully functioning (rehabilitated) irrigation scheme. In several project areas, such soft components began before reliable irrigation was restored, limiting their uptake.
Why was there a difference between what was planned and what happened?	There were delays in the implementation of civil works to rehabilitate irrigation infrastructures (as described above).
What can AIIB do differently in the next project?	Despite requiring a limited amount of financing (compared to investments in infrastructure rehabilitation), planning of irrigation modernization needs to be improved, taking into account the various infrastructure readiness and the complexity of rehabilitation works across the Project area. Irrigation modernization

	should be carefully sequenced to start from irrigation schemes requiring minimal rehabilitation works, and rolled out to those requiring more extensive civil works. Improvement of irrigation monitoring systems (including operationalization of sensors, gauges, and remote data acquisition techniques) should take priority, as it is the foundation to advance managerial regimes and institutional settings.
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Lesson 8.

Category	Construction and Preparations
What had AIIB planned would happen?	No or minimal disturbance to the planned civil works from water-related disasters.
What happened during implementation?	Floods in the Provinces of North Sumatra and West Java (in the Sei Ular Irrigation Scheme and Salamdarma Irrigation Sub-Scheme in early 2024) have significantly delayed civil works. The finalization of these delayed civil works eventually became the main reason for extending the loan closing date.
Why was there a difference between what was planned and what happened?	Inadequate consideration of water-related risks in the planning of project scheduling. No analysis was conducted regarding the potential impact of recurring flooding on the Project areas and implementation plan.
What can AIIB do differently in the next project?	A more proactive design and risk planning, especially in areas with a historical occurrence of water-related disasters. The impact of water-related disasters could also be minimized with vigilant planning and execution of O&M activities in the Project areas. Flooding occurred in the Project areas, specifically impacting the safety and performance of siphon structures (which are inherently flood-prone structures), could have been better mitigated through a more vigilant O&M. The potential impact of water-related disasters should be accounted for in preparing key Project implementation plans, including aspects related to budgeting and scheduling.

6. Client feedback

The client has had an positive experience working with AIIB under SIMURP, particularly in aspects related to accessibility, flexibility, and responsiveness. The client highly appreciates the Project Team's provision of timely facilitation and clarification required for the several Project Changes and amendments to the Loan Agreement conducted during SIMURP's implementation. The client also welcomes AIIB's value-added contribution in shaping SIMURP into an impactful project, through innovative investments in climate-smart agriculture and irrigation services agreements, which complement the physical rehabilitation of irrigation infrastructure. The client expects continued support from AIIB on irrigation management (reflected by the ongoing discussions for a succeeding project focusing on lowland and small-scale irrigation systems).

Reflecting on the SIMURP's experience, the client provides several feedback to improve the Bank's future support: (1) AIIB to strengthen its technical support during project preparation and implementation. The Bank is expected to mobilize resources to support project preparation and knowledge transfer (learning from Bank's related experience in other members), to meet the market's practice, and in anticipation of budget constraints within the government, (2) As much as possible, future projects adopt the government's policies, procedures, and administrative mechanisms related to procurement and environmental and social safeguards, (3) A phased

irrigation modernization is expected for future projects. This begins with urgent repairs and institutional development before introducing new approaches. To avoid implementation delays in low-capacity Project Implementation Units, investments in civil works should be made in parallel (or even after) organizational strengthening, such as updating Standard Operating Procedures and related planning processes (including water allocation protocols), and conducting subsequent training sessions (including those on procurements).

Annex: Client Feedback on the Project

1. Professionalism and Timeliness of Support: Are the services and support provided by the Project Team professional, sufficient and in time, during project preparation and project implementation? Please provide some specifics or details to illustrate your point. **Response:** *The AIIB Team, as a partner to the World Bank Team, has provided professional, adequate, and timely support during both the preparation and implementation stages of the SIMURP. Their consistent guidance and clear directions have been instrumental in addressing various implementation challenges.*

2. Accessibility of the Project Team: Is it convenient to access the Project Team's services and support? Please provide some specifics or examples as an illustration. **Response:** *Access to the World Bank and AIIB Teams has been very good. Communication could be carried out promptly and transparently, whether through meetings, online discussions, or written correspondence, thereby facilitating coordination conducted directly or through consultants.*

3. Flexibility and Responsiveness: Does the Project Team demonstrate flexibility and efficiency during project preparation and project implementation? Please provide some specifics or examples as an illustration. **Response:** *The World Bank and AIIB Teams demonstrated a high degree of flexibility and responsiveness, particularly in addressing changing field conditions and external challenges. Their prompt responses to requests for clarification and administrative approvals greatly supported the smooth implementation of the SIMURP. This was evident in the amendment process of the Loan Agreement (L/A) concerning the reallocation of funds from Component B to Component A, as well as the addition of project sites.*

4. Value Addition of AIIB's Financing: What is the value addition of AIIB's financing in the Project? **Response:** *Financing under SIMURP has provided significant added value to farmers' incomes through various activities, including the rehabilitation/modernization of irrigation networks, strengthening of water user farmer organizations (IP3A, GP3A, and P3A), implementation of the Irrigation Services Agreement (ISA), and the adoption of Climate Smart Agriculture (CSA) by farmer groups (Poktan). Furthermore, SIMURP implementation has served as an efficient financing solution to support the Government's irrigation infrastructure development priorities. Going forward, AIIB is expected to further enhance its efficiency by reducing the number of documents required, simplifying the approval procedure, and utilizing digital systems to enhance efficiency and transparency as well as strengthening technical support during both project preparation and implementation stages. At the preparation stage, AIIB is also expected to provide grants, thereby accelerating implementation in light of the Government's budget constraints for project preparation activities.*

5. Interest in Future Engagement: Will you consider working with the AIIB again in infrastructure development? Please provide a few specific reasons. **Response:** *The Strategic Plan (Renstra) of the Directorate General of Water Resources, Ministry of Public Works (MPW) for 2025–2029 aims to support the Indonesia Maju vision through the development of reliable and sustainable water resources infrastructure. This direction is aligned with the National Medium-Term Development Plan (RPJMN) 2025–2029 and national priorities, including food security and poverty alleviation. Based on the experience of SIMURP implementation, the Directorate General of Water Resources expresses openness to exploring potential collaboration with AIIB in the development of irrigation infrastructure, including surface and/or lowland irrigation. The realization of such collaboration will be subject to the Government policies on development financing.*

6. Suggestions for Improvement: Do you have any suggestion to the Project Team and/or the AIIB for them to improve their operations in the future? **Response:** *Where feasible, administrative processes of procurement should follow the prevailing Government of Indonesia regulations (GOI Regulation). With regard to environmental, social, and occupational health and safety (OHS) aspects, relevant regulations of the Government and the Ministry of Public Works are already in place and being implemented. Therefore, lender requirements are expected to be aligned with these national provisions. As part of the learning process, lenders are also encouraged to share experiences from the implementation of similar projects in other countries that have received financing support, thereby facilitating knowledge transfer to the Government.*

7. Other Comments: Other comments, such as comments on the reporting requirements, approval of project changes, etc. **Response:** *SIMURP's integration of rehabilitation and modernization elements (e.g., SCADA, telemetry, asset management tools, STEP e-procurement) proved effective, though it demanded considerable technical capacity. Efficiency was constrained by lack of familiarity with digital procurement systems and coordination bottlenecks across ministries. Operational handovers required extended support and training. Adopt a phased modernization strategy, beginning with urgent repairs and institutional development before introducing advanced technologies. Procurement training, SOP harmonization, and piloting new technologies should be prioritized early.*

Emphasize “soft” modernization—improved SOPs, planning, and water distribution protocols—alongside hardware investments, particularly to avoid delays in low-capacity RBOs.

Annex 2: Summary of SIMURP's Development Impact Study

An ex-post development impact study of the SIMURP was conducted on selected irrigation schemes under the Project. It includes the irrigation schemes of **Jatiluhur** (where SIMURP invested in 109,830 hectares of its total area), **Karang Agung** (9,780 hectares), and **Jurang Sate** (6,290 hectares), representing the western, central, and eastern parts of Indonesia (and SIMURP's extensive geographical coverage). In total, the studied area covers about half of the Project area (approximately 253,000 ha). The selected project areas also represent the various agro-hydrological conditions under the Project, with Jatiluhur (the largest irrigation scheme in Indonesia) exemplifying (hydro-geologically favorable) irrigation schemes under increasing pressure from land use change and competition for water driven by urbanization, Jurang Sate demonstrating irrigation schemes in a semi-arid region, and Karang Agung illustrating tidal schemes which use the natural ebb-tide cycle to irrigate. The study was conducted through a combination of field surveys and satellite observations. Baseline and follow-up data (2016-2024) were compiled from open-access data relevant to irrigation performance (e.g., satellite imagery of land cover, remote sensing data on evapotranspiration, etc.) to observe changes in the cropping pattern driven by the Project, as reflected in the Normalized Difference Vegetation Index (NDVI) (*). A team from a local university was then mobilized in June 2025 to interview farmers within the selected irrigation schemes (and those outside the Project as control groups) to observe changes in farmers' productivity and livelihoods resulting from the Project. (**) The results of this impact evaluation show that SIMURP's investment has been **highly effective** in improving farm-level production and profitability, with distinct patterns of impact across Jatiluhur, Karang Agung, and Jurang Sate. The Project has been highly relevant, with its impact showing long-term potential to sustain increased profitability and production in the rehabilitated areas. Some key results from the analysis are provided below (***):

- (1) **Jatiluhur** experienced the most substantial gains, with the net value of agricultural production more than doubling in the dry season, driven by (a) extensive margin: a 46% increase in rice-cultivated area, (b) intensive margin: a 25% rise in rice yields and a 16% reduction in per-hectare costs, largely due to labor savings from improved infrastructure.
- (2) **Karang Agung** saw a 35% increase in net value during the rainy season, with a limited increase in the dry season. Gains were driven entirely by a 30% expansion of cultivated areas (the revitalization of abandoned fields). However, net value per hectare has not increased, indicating no improvement in land productivity. This was mainly attributed to the widespread practice of not cultivating during dry seasons, which was shaped by years of water shortages during those seasons.
- (3) **Jurang Sate** recorded a 24% increase in net value, but only during the rainy season. Gains occurred only along the intensive margin, with a 5% increase in yields and a 16% reduction in costs per hectare. This study illustrates that irrigation investments across Indonesia's diverse agro-hydrological zones can substantially enhance farm profitability, but the magnitude and mechanisms of impact are highly context-dependent. Results from Jatiluhur highlight the potential for significant gains from irrigation investments in ecologically favorable areas for crop production. However, in more challenging hydrological settings like Karang Agung and Jurang Sate, the benefits have remained focused on the rainy season, with dry-season gains still constrained by factors such as drought, salinity, and limited farmer availability. Some farmers are engaged in other work (e.g., construction work or other physical labor in urban areas) due to the historical water shortage during the dry season. These findings underscore the need to tailor irrigation strategies to local agro-hydrological realities and to bundle irrigation investments with farm-level support, such as access to improved production inputs and expertise. As the Bank intends to continue its contribution to Indonesian irrigation management, these findings will be relevant in shaping and optimizing the impact of its future financings - with the most immediate opportunity being the 'Optimizing Lowland Irrigation for Food Security Project', which has been designed to scale-up the SIMURP's investments in lowland irrigation, aligned with the country's 2025-2029 National Mid-term Development Plan, and included in AIIB's 2025-2029 Multi-Year Rolling Pipeline for Indonesia. (*) NDVI from MODIS/Terra Vegetation Indices Monthly L3 Global 1km SIN Grid 061; precipitation from GPM IMERG Late Precipitation L3 1-day 0.1-degree V07 (GPM_3IMERGDL); land surface temperature from MODIS/Aqua Land Surface Temperature/Emissivity 8-Day L3 Global 1km SIN Grid V061. (**) Sample sizes of the treatment groups in Jatiluhur, Karang Agung, and Jurang Sate are 450, 348, and 350 household observations; and the comparison groups are 449, 372, and 349 households' observations respectively. (***) All impact estimates presented are statistically significant at the 95% confidence interval based on the underlying survey sample.