Report and Recommendation of the President to the Board of Directors

INTERNAL

Project Number: 55020-001
November 2022

Proposed Loan
Republic of Indonesia: Infrastructure Improvement for Shrimp Aquaculture Project

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 24 October 2022)

Currency unit	–	rupiah (Rp)
Rp1.00	=	$0.0000644
$1.00	=	Rp15,533
$1.00	=	¥149.90

ABBREVIATIONS

ADB	–	Asian Development Bank
COVID-19	–	coronavirus disease
ha	–	hectare
INDOGAP	–	Indonesian Good Aquaculture Practices
MHADP	–	*masyarakat hukum adat* (customary community) development plan
MMAF	–	Ministry of Marine Affairs and Fisheries
O&M	–	operation and maintenance
PAM	–	project administration manual
UPT	–	unit pelaksana teknis (technical operating unit)
SADP	–	sustainable aquaculture development plan
STELINA	–	*sistem telusur dan logistik ikan nasional* (national fish traceability and logistical system)

NOTE

In this report, "$" refers to United States dollars and “¥” refers to Japanese Yen.

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[a] Outposted to the Indonesia Resident Mission.

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PROJECT AT A GLANCE

1. Basic Data

Project Number: 55020-001

Project Name	Infrastructure Improvement for Shrimp Aquaculture Project	**Department/Division**	SERD/SEER
Country	Indonesia	**Executing Agency**	Ministry of Marine Affairs & Fisheries
Borrower	Republic of Indonesia		
Country Economic Indicators	https://www.adb.org/Documents/LinkedDocs/?id=55020-001-CEI		
Portfolio at a Glance	https://www.adb.org/Documents/LinkedDocs/?id=55020-001-PortAtaGlance		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Agriculture, natural resources and rural development**	Agriculture research and application	24.600
	Agro-industry, marketing, and trade	0.700
	Fishery	60.800
	Irrigation	6.900
	Total	**93.000**

3. Operational Priorities

- ✓ OP1: Addressing remaining poverty and reducing inequalities
- ✓ OP2: Accelerating progress in gender equality
- ✓ OP3: Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
- ✓ OP5: Promoting rural development and food security

Climate Change Information

GHG reductions (tons per annum)	0
Climate Change impact on the Project	High

ADB Financing

Adaptation ($ million)	12.600
Mitigation ($ million)	0.000

Cofinancing

Adaptation ($ million)	0.000
Mitigation ($ million)	0.000

Sustainable Development Goals

SDG 1.5
SDG 2.3, 2.4, 2.5
SDG 5.5
SDG 8.2
SDG 10.2
SDG 12.4
SDG 13.a

Gender Equity and Mainstreaming

Effective gender mainstreaming (EGM) ✓

Poverty Targeting

Geographic Targeting ✓

4. Risk Categorization: Low

5. Safeguard Categorization

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

6. Financing

Modality and Sources	Amount ($ million)
ADB	**93.000**
Sovereign Project (Regular Loan): Ordinary capital resources	93.000
Cofinancing	**0.000**
None	0.000
Counterpart	**11.115**
Government	11.115
Total	**104.115**

Currency of ADB Financing: Yen

Note: The project is estimated to cost ¥15,606,865,425.14 including a regular loan of ¥13,940,700,000.00 from Asian Development Bank ordinary capital ($1.00= ¥149.90)

Source: Asian Development Bank

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republic of Indonesia for the Infrastructure Improvement for Shrimp Aquaculture Project.

2. The project will help the Ministry of Marine Affairs and Fisheries (MMAF) to introduce sustainable shrimp aquaculture to increase the productivity, quality, profitability, and environmental sustainability of shrimp farming by smallholders. The project will improve smallholder farmers' access to quality inputs, production, and post-harvest practices and traceability through infrastructure, capacity support, and value chain strengthening in selected locations across Bali, Banten, Central Java, East Java, Lampung, Nangro Aceh Darusalam, and South Sulawesi provinces. Investment in infrastructure and capacity strengthening will directly benefit about 5,210 smallholder farmers including 1,042 women farmers, while about 35,000 smallholder farmers of which about 7,000 are women, will benefit from improved access to quality inputs and capacity building programs on sustainable and climate adaptive aquaculture. The project will also contribute to the recovery from the coronavirus disease (COVID-19) pandemic by providing employment opportunities and stimulating rural entrepreneurship.

II. THE PROJECT

A. Rationale

3. **Macroeconomic context**. Indonesia's economy shows strong signs of recovery from the COVID-19 pandemic with growth forecast at 5.2% in 2022.[1] Windfall export revenues are enabling the government to cushion the impact of high food and fuel prices on vulnerable populations and stay on track with fiscal consolidation. However, sustained economic recovery remains uncertain due to increasing economic headwinds. A likely global economic slowdown, monetary tightening, and the continued impact of the Russian invasion of Ukraine could negatively affect growth, exports, and the fiscal balance going into 2023.[2]

4. **Fisheries performance**. In 2021, Indonesia's fisheries industry (aquaculture and capture fisheries) was worth $30.1 billion, or 20.4% of the agriculture gross domestic product and 2.8% of the national gross domestic product.[3] Shrimp, milkfish, and tilapia are the main aquaculture commodities by value; seaweed is the main one by tonnage. In 2020, 401,841 brackish-water smallholder farmers were operating across an area of 967,600 hectares (ha).[4] The COVID-19 pandemic had an enormous impact on the industry, disrupting logistics and hampering production; processing; and value chains, both wholesale and retail.[5]

5. **Shrimp aquaculture**. Indonesia is among the top five shrimp producers in the world, with a global market share of 8.7%.[6] Its shrimp product exports to the European Union, Japan, and the United States totaled $2.04 billion equivalent in 2020.[7] Indonesia is a leading exporter of frozen seawater shrimp but lags its peers in exports of fresh, salted, or smoked shrimp. The main

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[1] Asian Development Bank (ADB). 2022. *Asian Development Outlook 2022 Update: Entrepreneurship in the Digital Age*. Manila.

[2] The government has committed to return to the statutory ceiling for fiscal deficit of 3% of gross domestic product by 2023. ADB. 2022. *Asian Development Outlook 2022 Update: Entrepreneurship in the Digital Age*. p. 170. Manila.

[3] Government of Indonesia, Ministry of Marine Affairs and Fisheries (MMAF). 2022. *2021 Annual Report*. Jakarta.

[4] 55% of the farmers manage farms of less than 2 hectares (ha) and 27% operate farms of 2–5 ha.

[5] Food and Agriculture Organization of the United Nations. 2020. *The Impact of COVID-19 on Fisheries and Aquaculture Food Responses (Information Paper)*. Rome.

[6] The other four top shrimp producers are Argentina, Ecuador, India, and Viet Nam. D. Workman. 2021. Big Export Sales for Frozen or Fresh Shrimps. *World's Top Export.* 15 July.

[7] Government of Indonesia. 2021. *Statistics Indonesia, 2021*. Jakarta.

farmed shrimp species is the whiteleg shrimp *(Litopenaeus vannamei),* which accounts for 80% of production. The whiteleg shrimp is cultivated by large companies and about 50% of the smallholders.[8] The remaining 50% of the smallholders cultivate the tiger shrimp (*Penaeus monodon*) extensively.[9] While the potential for Indonesia's shrimp aquaculture is high, the traditional mode of farming employed by smallholders constrains productivity, profitability, and environmental sustainability.

6. **Unsustainable input sourcing.** MMAF broodstock centers do not have sufficient stocks to meet the increasing demand for whiteleg shrimp fry nationwide,[10] and about 80% of smallholder farmers purchase cheap and non-specific pathogen-resistant seeds from small-scale hatcheries. Although MMAF has established protocols for shrimp breeding, lack of knowledge and adherence to the protocols on the part of small-scale hatcheries has led to biosecurity concerns.[11] Fishmeal is a key ingredient for feed in shrimp aquaculture, and is mainly imported contributing to the global fish stock depletion. It is imperative to motivate Indonesia's feed industry to shift to alternative feed materials and for farmers to be self-sufficient in feed.

7. **Damaged environment and constraints on sustainability.** Unregulated aquaculture has been a main cause of mangrove deforestation, and contaminants from agriculture, human sewage, and industrial waste are destroying coral reefs and seagrass beds. Mangroves— which are natural habitats of many plants and animals, and the largest carbon storage ecosystem— impede coastal erosion and prevent seawater intrusion. MMAF issued a regulation to prevent the use of mangrove ecosystems for shrimp production, which is reflected in provincial spatial plans. To move toward more sustainable shrimp production, mangroves must be revitalized since they provide protection against coastal erosion and help clean wastewater from ponds.[12]

8. **Biosecurity and disease management.** The absence, or ineffective application, of biosecurity management, residue control, and measures to mitigate diseases in traditional farming poses serious risks to shrimp production. Farmers need to gain more knowledge and capacity to reduce the occurrence of shrimp diseases and must learn to curb pollution from their operations. While MMAF has 15 accredited laboratories across the country to control water quality and residue in pond facilities, more laboratories with higher analytical capacities are needed.[13]

9. **Infrastructure and farming practices not suited for quality production and profitability.** Most smallholder ponds do not have a water treatment reservoir or an inlet reservoir to stabilize brackish water, which results in the discharge of untreated effluents into the ecosystem and a high occurrence of shrimp diseases. Poor drainage facilities limit water circulation in the systems. Lacking capital and access to electricity, traditional farms are not equipped with aerators and unable to maintain a constant oxygen level in the ponds, which in turn curbs productivity. Poor uptake of modern farming practices further constrains traditional shrimp farming. To improve their operations' profitability and environmental sustainability, smallholder farmers need to be encouraged to use the ecosystem-based farming model developed by MMAF. Regular operation and maintenance (O&M) of aquaculture assets is also needed. MMAF does not have an asset

[8] Whiteleg shrimp production requires semi-intensive or intensive technologies with feed from feed mills, water pumps and aerators, high stocking rates, and purchase of postlarvae (immature fish past the larval stage) from hatcheries.
[9] This involves limited feed from feed mills, limited water control, postlarvae from the ocean, and low stocking rates.
[10] Broodstock are mature shrimp used in aquaculture for breeding purposes.
[11] Biosecurity is essential to prevent pathogen introduction, emergence, and spread within and between farms.
[12] F. Muzaki, et al. 2012. *Menjelajah Mangrove Surabaya.* Surabaya.
[13] To address biosecurity, MMAF established a strategy for disease control. Government of Indonesia, MMAF. *Strategi Nasional Kesehatan Ikan dan Lingkungan, 2015–2020*. (National Strategy for Fish and Environmental Health, 2015-2020). Jakarta.

management information system, which limits its capacity to prepare O&M budgets. Deferred maintenance reduces the life of the assets and increases the budget for rehabilitation.

10. **Lack of traceability limiting access to international markets.** Developed countries are increasingly monitoring the quality of shrimp imports for transparency and traceability, drug and chemical residues, and environmental damage.[14] As awareness of food safety grows among consumers, Indonesian shrimp producers must improve traceability along the shrimp value chain and raise the standards of hygiene in shrimp processing. Only large shrimp producers, hatcheries, and feed suppliers currently comply with MMAF's framework for Indonesian Good Aquaculture Practices (INDOGAP). MMAF will need to expand the use of its *sistem telusur dan logistik ikan nasional* (national fish traceability and logistical system, STELINA) by farmers and other actors along the value chain if Indonesia is to maintain a strong position in international markets.

11. **Complex value chain.** The shrimp value chain is complex and involves private sector players in inputs (hatcheries and feed suppliers), production (farmers and equipment providers), post-harvest activities (aggregators and transformation plants), and consumer reach (marketing and exporters). While two large companies in Indonesia have integrated value chain facilities and their own feed mills, hatcheries, farms, and processing and export facilities, the industry predominantly consists of small and medium-sized enterprises. Smallholder farming profitability is constrained by the lack of economies of scale, resulting in smallholders' weak bargaining power in negotiations with aggregators. Poor harvesting and handling practices degrade the quality of the shrimp and increase losses. The lack of quality road infrastructure constrains access to inputs and markets, increasing costs and putting harvests at risk. Greater collaboration between smallholder farmers and suppliers and off-takers would help farmers improve the quality of their products to meet industry requirements. Increased production with greater quality and quantity of shrimps would attract private sector investment along the value chain.

12. **Access to finance.** MMAF provides access to preferential financing for smallholders. However, most smallholders lack the capacity and financial literacy to prepare quality business proposals and only a few benefits from this funding. Risk averse commercial banks are reluctant to finance aquaculture operations because they have a limited understanding of the risks associated with shrimp production. Smallholders therefore need support in preparing quality business plans and managing their loans.

13. **Impacts of climate change.** Shrimp aquaculture takes place mainly in coastal areas, making ponds highly vulnerable to tidal floods and sea level rise. Shrimp aquaculture is also highly vulnerable to rising temperatures, harmful algal blooms, changes in rainfall patterns and in sea salinity, leading to increased risk of diseases. Adoption of climate adaptive practices is critical for farmers to increase the resilience of their farms.[15] Recognizing the country's vulnerability to the impacts of climate change and commitments under the updated Nationally Determined Contributions under the Paris Agreement, MMAF supports the introduction of sustainable and climate adaptive shrimp production systems.[16]

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[14] From 2012 to 2017, the segment of sustainably sourced seafood in European markets grew by about 12% while demand for other seafood segments declined. H. Rubel, et al. 2019. *A Strategic Approach To Sustainable Shrimp Production in Indonesia: The Case for Improved Economics and Sustainability*. Boston Consulting Group.

[15] Climate adaptive practices include optimization of feed, improvement of health management, implementation of biosecurity programs for aquaculture clusters, and ecosystem restoration. Food and Agriculture Organization of the United Nations, 2017, Fisheries and Aquaculture Circular No. 1142.

[16] Government of Indonesia, Ministry of Environment and Forestry. 2021. Updated Nationally Determined Contribution Republic of Indonesia. Jakarta; and Law No. 16 of 2016 on the enactment of the Paris Agreement to the United Nations Framework Convention on Climate Change.

14. **Gender**. 57,102 (13.9%) women and 352,737 (86.1%) men are registered in the MMAF system as active players in the aquaculture industry.[17] Men play a dominant role in production, while women participate in feeding and harvest sorting. Women also engage in marketing and processing, including as day laborers, which is informal, insecure, and poorly paid work. Female farmers have fewer opportunities to access government extension services and aquaculture technologies, which reduces their prospects for higher wages. The lack of sex-disaggregated data (qualitative and quantitative) constrains gender-responsive policy making in aquaculture. More efforts are also needed to operationalize MMAF's gender mainstreaming policies.

15. **Modality**. The project meets the criteria for the sector loan modality of the Asian Development Bank (ADB) because (i) MMAF has a clear development plan for aquaculture that provides targets, benchmarking, and an investment plan for shrimp aquaculture;[18] (ii) MMAF, as the executing agency, is assessed to have strong institutional capacity to implement the plan with additional support from the project; and (iii) the project will strengthen policies and regulations in support of sustainable aquaculture. The sector loan modality is also suitable given the large number of small subprojects for farmers' groups to be supported by the project. The subproject selection criteria are detailed in the project administration manual (PAM) to ensure that subprojects are identified, designed, and approved according to well defined specifications.[19]

16. **Strategic context.** The Government of Indonesia's National Medium-Term Development Plan 2020–2024 promotes aquaculture and proposes to increase (i) the number of aquaculture production centers to 50 in 2024 from 10 in 2020, and (ii) the export value of fisheries to $8.0 billion in 2024 from $6.2 billion in 2020.[20] The MMAF National Shrimp Farm Development Program 2020–2024 aims to increase shrimp production to 1.29 million tons by 2024 (from 527,397 tons in 2019).[21] The project is also aligned with (i) ADB's Action Plan for Healthy Oceans and Sustainable Blue Economies by promoting sustainable aquaculture, and (ii) ADB's country partnership strategy 2020–2024 for Indonesia (pathway 3: strengthening resilience).[22] The project's alignment with ADB's Strategy 2030 is presented in Table 1.

Table 1: Alignment with Strategy 2030

Strategy 2030 Operation Priority	Result of Project Interventions
Addressing remaining poverty and reducing inequalities	Production capacity and infrastructure of smallholders' farms improved
Accelerating progress in gender equality	Laboratories and breeding centers improved to provide workspace for women; and women access to extension services increased
Tackling climate change and building climate and disaster resilience, and enhancing environmental sustainability	Resilience of buildings to disasters and climate change enhanced, taking into account sea level rise and earthquake risk; and wastewater management improved
Promoting rural development and food security	Farmers' groups established and sustainable aquaculture development plans developed to access credit

Source: Asian Development Bank.

[17] Government of Indonesia, MMAF. *Dashboard of the Main Players in the Marine and Fisheries Sector* (accessed 23 April 2022).
[18] Government of Indonesia, MMAF, Directorate General of Aquaculture. 2020. *Rencana Strategis Tahun 2020–2024* (Strategic Plan 2020–2024). Jakarta.
[19] Project Administration Manual (accessible from the list of linked documents in Appendix 2).
[20] Government of Indonesia, Ministry of National Development Planning (BAPPENAS). 2020. *Rencana Pembangunan Jangka Menengah Nasional, 2020–2024* (National Medium-Term Development Plan). Jakarta.
[21] The program calls for (i) introduction of sustainable aquaculture, (ii) increased production of high-quality and affordable broodstock, (iii) development of certified small-scale hatchery units, and (iv) provision of technical assistance and infrastructure to small scale farmers. Government of Indonesia, MMAF. 2020. *Program Percepatan Pengembangan Tambak Udang Nasional* (Accelerated Development Program National Shrimp Farm). Jakarta.
[22] ADB. 2019. *Action Plan for Healthy Oceans: Investing in Sustainable Marine Economies for Poverty Alleviation in Asia and the Pacific*. Manila; and ADB. 2020. *Country Partnership Strategy: Indonesia, 2020–2024—Emerging Stronger*. Manila.

17. **Lessons learned.** ADB is reengaging in the aquaculture sector in Indonesia since the Sustainable Aquaculture Development for Food Security and Poverty Reduction Project closed on 15 December 2014. The project builds on the following lessons in the aquaculture sector: (i) participatory and adaptive approach in infrastructure development and associated services contribute to sustainability of responses to climate change, (ii) focus on extension services and infrastructure is critical to pave the way for private sector investment in supply and value chains, (iii) gender mainstreaming through group formation and training programs is an effective strategy for empowering women, (iv) strengthening cooperatives helps to sustain project benefits, (v) the use of local facilitators ensures continuity of services to beneficiaries, and (vi) market assistance should be regularly provided by establishing market links with potential buyers.[23]

B. Project Description

18. The project is aligned with the following impact: contribution of the fisheries industry to the national economy increased (footnote 20). It will have the following outcome: productivity, profitability, and environmental sustainability of shrimp aquaculture increased.[24]

19. **Output 1: Quality and sustainability of inputs for shrimp production increased.** The project will construct a modern broodstock center and two multiplication centers to provide small-scale hatcheries with access to affordable and quality whiteleg shrimp broodstock. The project will also facilitate the transfer of knowledge for producing high-quality genetic shrimp fry from the Oceanic Institute of Hawaii to MMAF to reduce reliance on imported broodstock.[25] To control the quality of broodstock and juveniles, and the water quality in production facilities, the project will finance the construction and equipment of climate- and disaster-resilient laboratories under MMAF. All facilities will incorporate gender-responsive and inclusive features.[26] The project will train MMAF staff in operating these facilities. This output will also help small and medium-sized seed suppliers to comply with broodstock breeding protocols, good hatchery practices, and biosecurity and environmental monitoring procedures to increase the quality of broodstock. It will strengthen farmers' capacity to produce their own feed in accordance with the national fish feed self-sufficiency program, *Gerakan Pakan Mandiri*, to reduce reliance on imported feed.[27]

20. **Output 2: Sustainable and climate adaptive aquaculture infrastructure and services developed.** The project will support the establishment and strengthening of farmers' groups, which will enable smallholders, including women farmers, to consolidate their production facilities using a cluster approach. Local facilitators will help them to prepare sustainable aquaculture development plans (SADPs), which will form the basis for investment in their respective clusters. The SADPs will also help farmers to access credits including MMAF's preferential financing, and explore partnerships with the private sector. The project will upgrade farmers' ponds and selected MMAF production facilities as demonstration sites using a sustainable and climate adaptive aquaculture model, which aims to increase production while minimizing its impact on the ecosystem.[28] For each cluster, the project will rehabilitate or upgrade associated infrastructure

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[23] ADB. 2015. *Completion Report: Sustainable Aquaculture Development for Food Security and Poverty Reduction Project*. Manila; and ADB. 2019. ADB Support for Fisheries and Marine Resource Management – Lessons Learned and Way Forward. *Promoting Rural Development and Food Security, 2019-2024.* Manila (Appendix 3).

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

[25] The Oceanic Institute of Hawaii is specialized in development and transfer of technologies in maturation, hatchery, nursery, and growout techniques for multiple fish species, and has developed a collaboration program with MMAF.

[26] These include lactation rooms, separate male and female toilets, and separate male and female prayer rooms.

[27] On 8 November 2021, the Global Environment Facility approved a project concept for a regional grant amounting to $4.4 million, of which around $3.2 million will be allocated to Indonesia to complement the project activities by engaging feed suppliers to diversify feed raw material and improving shrimp feed tracking.

[28] MMAF technical operating units will contract farmers groups using simple engineering design to upgrade their ponds.

(canals, production roads, inlet reservoirs, and wastewater treatment facilities) and purchase equipment to support semi-intensive aquaculture production for selected clusters.[29] Farmers will plant and maintain mangrove trees in inlet and outlet canals and along the shoreline to help improve water quality and reduce soil erosion. This output will also support MMAF with establishing O&M guidelines and developing an asset management information system for infrastructure lifecycle management. The project will strengthen the technical capacity of farmers, including women farmers, to adhere to the INDOGAP guidelines for environmentally and economically sustainable shrimp production.

21. **Output 3: Shrimp aquaculture supply chain strengthened.** The project will build the capacity of female and male farmers for food safety, handling and cold chain management, processing, and marketing of shrimps. To improve transparency, the project will facilitate the registration of broodstock and feed suppliers, farms, aggregators, and processors in the INDOGAP system and the tracing of transactions in MMAF's STELINA. In support of a harmonized regulatory framework, the project will assist MMAF in preparing quality standards, and in rationalizing regulations and incentive systems for sustainable aquaculture.

C. Value Added by ADB

22. The project will build on past and ongoing initiatives supported by Indonesia's development partners in the aquaculture sector.[30] ADB will add value by (i) introducing sustainable aquaculture practices to reduce pressure on the ecosystem, (ii) supporting the transfer of knowledge from the Oceanic Institute of Hawaii to enable Indonesia to produce high-quality genetic broodstock, (iii) introducing technology to improve the O&M of aquaculture assets, and (iv) providing technical support to improve shrimp feed tracking (footnote 27).

D. Summary Cost Estimates and Financing Plan

23. The project is estimated to cost ¥15,606,865,425.14 ($104.1 million equivalent) (Table 2). Detailed cost estimates by expenditure category and by financier are included in the PAM (footnote 19). The investment will support (i) civil works and equipment for laboratories and aquaculture breeding centers; (ii) upgrades of aquaculture ponds and purchase of equipment; and (iii) capacity strengthening for farmers and value chain actors to ensure compliance with sustainable aquaculture practices. The costs include project management supervision and capacity building, especially regarding safeguards and gender mainstreaming.

24. The government has requested a regular loan of ¥13,940,700,000.00 ($93.0 million equivalent)[31] from ADB's ordinary capital resources to help finance the project. The loan will have a 18-year term, including a grace period of 7.5 years; an interest rate determined in accordance with ADB's Flexible Loan Product; 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.

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[29] The project will promote fair water allocation among water users. Equipment includes wastewater equipment, water pumps, paddle wheels, growers and finishers for shrimp feed, spiral and plastic hose, diluted oxygen and pH meters, and refractor salinometers.

[30] Such as (i) Food and Agriculture Organization of the United Nations self-sufficient feed initiative, improved traceability for farmed shrimp, and improved biosecurity governance and legal framework for sustainable aquaculture production; (ii) Swiss State Secretariat for Economic Affairs-United Nations Industrial Development Organization Global Quality and Standards Programme, Smart Fish Phase 2; and (iii) Government of the Netherlands piloting a recirculation aquaculture system farm. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development (Fisheries [Shrimp Aquaculture]) (accessible from the list of linked documents in Appendix 2).

[31] ¥149.90 = $1.00 as of 24 October 2022.

25. The summary financing plan is in Table 3. ADB will finance the expenditures in relation to works, goods, loan implementation consulting services, and incremental operating costs. The government will contribute ¥1,666,165,425.14 ($11.1 million equivalent) to finance taxes and duties, financing charges during implementation and in-kind contribution of staff and office.

26. Food security investments are estimated to cost ¥15,606,865,425.14 ($104.1 million equivalent), including a ¥13,940,700,000.00 ($93.0 million equivalent) loan from ordinary capital resources and ¥1,666,165,425.14 ($11.1 million equivalent) to be financed by the government. As the project aims to increase shrimp aquaculture productivity and sustainability, 100% of the cost will contribute to improving food security.

Table 2: Summary Cost Estimates
(¥ million)

Item		Amount[a]
A.	**Base Cost**[b]	
	1. Output 1: Quality and sustainability of inputs for shrimp production increased	5,624.4
	2. Output 2: Sustainable and climate adaptive aquaculture infrastructure and services developed	5,426.5
	3. Output 3: Shrimp aquaculture supply chain strengthened	2,487.3
	Subtotal (A)	**13,538.3**
B.	**Contingencies**[c]	**1,744.1**
C.	**Financial Charges During Implementation**[d]	**324.5**
	Total (A+B+C)	**15,606.9**

Note: numbers may not sum up precisely due to rounding.
[a] Includes taxes and duties of ¥1,341.63 million to be financed by the government through tax exemptions.
[b] In mid-2022 prices as of 24 October 2022.
[c] Physical and price contingencies, and a provision for exchange rate fluctuation are included.
[d] Includes interest, commitment, and other charges on all sources of financing.
Source: Asian Development Bank estimates.

Table 3: Summary Financing Plan

Source	Amount (¥ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (regular loan)	13,940.7	89.3
Government of Indonesia	1,666.2[a]	10.7
Total	**15,606.9**	**100.0**

[a] Includes taxes and duties of ¥1,341.6 million to be financed by the government through tax exemptions.
Source: Asian Development Bank estimates.

27. Climate change adaptation is estimated to cost ¥1,881,994,500.00 ($12.6 million equivalent). ADB will finance 100% of the adaptation costs. Details are in the climate change assessment report.[32] The report shows that the project is a continuing effort to shift Indonesia's shrimp aquaculture industry to a low-carbon and climate-resilient path aligned with the National Medium-Term Development Plan, 2020–2024 (footnote 20), Indonesia's updated Nationally Determined Contributions (footnote 16), and the Low Carbon Development Initiative.[33]

E. Implementation Arrangements

28. Implementation arrangements are summarized in Table 4 and described in detail in the PAM (footnote 19).

[32] Climate Change Assessment (accessible from the list of linked documents in Appendix 2).
[33] Government of Indonesia, BAPPENAS. 2019. *Low Carbon Development: A Paradigm Shift Towards a Green Economy in Indonesia (Full Report)*. Jakarta.

Table 4: Implementation Arrangements

Aspects	Arrangements		
Implementation period	December 2022 –December 2027		
Estimated completion date	31 December 2027		
Estimated loan closing date	30 June 2028		
Management			
(i) Oversight body	NSC chaired by BAPPENAS, with MMAF, MOF, MOT, and MOV as members.		
(ii) Executing agency	DGA under MMAF		
(iii) Key implementing agencies	DGA and UPTs		
(iv) Implementation units	(i) CPMU, DGA; and (ii) 7 PIUs under UPTs		
Procurement	OCB (nationally advertised)	80 works and goods contracts	¥7,458.9 million
	Request for quotations	21 goods contracts	¥324.1 million
	Community participation	220 works contracts	¥674.1 million
Consulting services	Quality- and cost-based selection	2,195 person-months	¥1,059.1 million
	Consultant's qualifications selection	192 person-months	¥37.8 million
	Individual consultant selection	2,520 person-months	¥523.7 million
	Direct contracting for advisory services	To be determined	¥661.7 million
Advance contracting	(i) consulting services for advisory services, project management, and technical consultants; and (ii) invitation for bids and bid evaluation for goods for mobile laboratories.		
Disbursement	Disbursement of ADB loan proceeds will follow ADB's *Loan Disbursement Handbook* (2022, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

ADB = Asian Development Bank; BAPPENAS = *Badan Perencanaan Pembangunan Nasional* (Ministry of National Development Planning); CPMU = central project management unit; DGA = Directorate General of Aquaculture; MMAF = Ministry of Marine Affairs and Fisheries; MOF = Ministry of Finance; MOT = Ministry of Trade; MOV = Ministry of Village, Development of Disadvantaged Regions and Transmigration; NSC = national steering committee; OCB = open competitive bidding; PIU = project implementation unit; UPT = *unit pelaksana teknis* (technical operating unit).
Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

29. Project preparation considered the (i) options to improve the economic and environmental sustainability of the infrastructure; (ii) options to maximize value chain benefits to farmers; and (iii) measures to minimize adverse social impacts.[34] The project team conducted technical due diligence on government facilities and two farmers' pond clusters as representative subprojects. The design of these facilities incorporates gender-responsive and gender-inclusive features, and adaptation measures to reduce climate change risks. Evaluations of the two representative farmers' pond subprojects against the eligibility criteria are detailed in the PAM (footnote 19). The project will use a participatory development approach, whereby beneficiary farmers will take an active part in the planning, design, implementation, and maintenance of their sustainable ponds.

B. Economic and Financial Viability

30. The economic analysis indicates that the shrimp farms, and the broodstock and multiplication centers are economically viable—their economic internal rate of return (13.2%)

[34] Consistent with the World Wildlife Fund guidance on sustainable semi-intensive shrimp farming. World Wildlife Fund – Indonesia. 2014. *Better Management Practices Seri Panduan Perikanan Skala Kecil Budidaya Udang Vannamei Tambak Semi Intensif dengan Instalasi Pengolahan Air Limbah* (Small Scale Fisheries Guide Series Vannamei Shrimp Cultivation Semi-Intensive Pond with Wastewater Treatment Plant). Jakarta.

exceeds the social discount threshold rate (9%). Key benefits include improved yields in semi-intensive farms, cost savings from the production of high-quality postlarvae, and revenues from the broodstock and multiplication centers. Sensitivity analysis on the impacts of investment and operating cost overruns, reductions in yield, and reductions in the shrimp output price indicates that the subprojects are robust against downside risks. MMAF will continue allocating budget to cover O&M costs for the broodstock and multiplication centers, laboratories, and MMAF demonstration ponds.

C. Sustainability

31. Incremental recurrent cost analyses were conducted for government infrastructure under outputs 1 and 2 to assess the government's capacity to meet the additional O&M requirements.[35] While increased revenues are expected from the upgraded broodstock and multiplication centers, and laboratories, MMAF will continue to allocate budget to ensure proper O&M of these facilities. Farmers will maintain their sustainable aquaculture production facilities, including mangroves. The project will support MMAF in developing O&M guidelines and an asset management information system which will support progress toward an infrastructure lifecycle management.

D. Governance

32. **Financial management.** ADB assessed the financial management of the Directorate General of Aquaculture and of the technical operating units—*unit pelaksana teknis* (UPTs) — as implementing agencies. The pre-mitigated financial management risk is rated *moderate* mainly because of (i) inconsistent financial management practices across UPTs and the lack of a comprehensive financial management manual, (ii) Directorate General of Aquaculture and UPTs' limited experience and capacity to comply with ADB disbursement procedures and financial management requirements, (iii) limited staff resources, (iv) limited capacity of the financial information systems to produce financial reports that meet ADB's requirements, and (v) a potential delay in the availability of counterpart funds during project implementation. The proposed mitigation measures include (i) the engagement of financial management consultants; (ii) capacity building on financial management, disbursement, and accounting systems for project staff; (iii) preparation of a project financial management manual; (iv) close coordination between implementing agencies; and (v) close monitoring of budget allocation.

33. **Procurement.** The procurement risk for the project is assessed to be medium, since no high-value and complex procurement is anticipated. Mitigation measures identified in the strategic procurement plan report include (i) engagement of procurement specialists, (ii) capacity building on procurement for project staff, (iii) strengthening of the executing agency's capacity to monitor procurement transactions, and (iv) timely application of the government budget plan to meet payment obligations. Procurement of goods and works, and the recruitment of consultants will be undertaken following the ADB's Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time).

34. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and MMAF. The specific policy requirements and supplementary measures are described in the PAM (footnote 19).

[35] Including the broodstock and multiplication centers, the seven laboratories, and the five MMAF demonstration ponds.

E. Poverty, Social, and Gender

35. **Poverty and social development.** The main beneficiaries of the project will be (i) 521 farmers' groups (about 5,210 smallholder farmers) who will receive infrastructure and capacity building support; and (ii) about 35,000 farmers, who will gain capacity to manage sustainable aquaculture and the value chain.[36] According to the National Statistics Agency, the average poverty rate in the target provinces ranged from 4.3% in Bali to 15.3% in Aceh in 2021. Surveys conducted in 2021 in selected project locations show that 90% of smallholder farmers live below the poverty line, and 69% of shrimp farmers are operating ponds of less than 2 ha. In 2021, 93% of the farmers in Indonesia were producing shrimp in a traditional way with an average productivity of 0.6 tons/ha/year. The project will help these traditional farmers to transform their farms into semi-intensive production systems with a yield of 3.0 tons/ha/year. Special attention will be paid to the needs of vulnerable groups especially those below the poverty line, the landless, the elderly, women, children, people without legal title to land, and indigenous peoples.

36. **Gender.** The project is categorized *effective gender mainstreaming*. Only a few women currently operate shrimp ponds. Poor women mainly work informally in post-harvest activities such as sorting and grading, which is insecure and poorly remunerated labor. While Indonesia has a robust policy framework for gender equality and disabilities inclusion, and MMAF has corresponding regulations, women farmers rarely benefit from government programs. The project will promote gender equality at various levels: (i) broodstock and multiplication centers as well as laboratories will be equipped with gender-responsive and gender-inclusive design features (footnote 26); (ii) at least 20% of the farmers receiving training will be women; (iii) at least 10% of the farmers receiving sustainable aquaculture practice certification will be women; (iv) the STELINA will be improved to provide sex-disaggregated data and a checklist on human welfare, including gender; and (v) technical instruments will be developed for gender mainstreaming (e.g., gender-responsive planning methods, toolkits, checklists, technical and gender training, and communications). Technical guidelines for shrimp aquaculture will be reviewed and revised to ensure that they are more sensitive to gender issues. MMAF and the UPTs will appoint gender focal persons to implement and monitor the gender equality and social inclusion action plan.[37]

F. Safeguards

37. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.[38]

38. **Environment (category B).** Based on MMAF's feasibility study and on basic or detailed engineering designs, an initial environmental examination and an environmental management plan were prepared for the broodstock center, the two multiplication centers, the seven laboratories, the five MMAF demonstration pond clusters, and the two sample farmers' ponds.[39] Since the identified subprojects are all existing facilities and ponds in highly modified environment, the main environmental impacts include wastewater discharge, and potential encroachment on coastal wetland and mangroves. Impacts from the rehabilitation of the associated rural infrastructure such as canals and roads will be moderate, and any adverse impacts will occur mainly during construction. The environmental impacts of laboratories are typically water pollution, and disposal of solid wastes and hazardous substances. All identified impacts can be

[36] Summary Poverty Reduction and Social Strategy (accessible from the list of linked documents in Appendix 2).
[37] Gender Equality and Social Inclusion Action Plan (accessible from the list of linked documents in Appendix 2).
[38] ADB. 2009. *Safeguard Policy Statement*. Manila.
[39] Initial Environmental Examination (accessible from the list of linked documents in Appendix 2). MMAF, with its own budget, prepared the detailed engineering designs for the seven laboratories, and the basic engineering designs for the broodstock center, the two multiplication centers, and the five MMAF demonstration ponds.

mitigated as presented in the environmental management plan. The project is expected to provide environmental benefits since it will improve broodstock and multiplication centers, strengthen waste management in the laboratories, and raise farmers' awareness of climate-resilient farming practices and on responsible use of chemicals. For the farmers' ponds to be identified during project implementation, an environmental assessment and review framework will guide the screening, assessment, and management of work.[40]

39. **Involuntary resettlement (category C).** The project is not expected to have involuntary resettlement impacts.[41] Due diligence conducted for the broodstock center, the two multiplication centers, and the seven laboratories under output 1, and the five MMAF demonstration ponds under output 2, confirmed that there would be no physical or economic displacement.[42] The upgrading of farmers ponds under output 2 will use a community based approach without any involuntary land acquisition.[43] The community development framework will guide farmers in pooling their land without land ownership transfer, for upgrading of their ponds to sustainable pond clusters.[44] The land pooling agreements will be reflected in the SADP, which also includes a capacity development plan; and information on land ownership, social, economic, and cultural backgrounds of the participating farmers. The SADPs prepared for the two representative farmers' ponds will serve as references for future SADPs to be prepared during project implementation. The project will conduct meaningful consultations with the targeted beneficiaries throughout the project's implementation. The project will also finance external monitoring agencies to monitor the implementation of the community development framework.

40. **Indigenous peoples (category B).** The project will benefit indigenous peoples (*masyarakat hukum adat* or customary communities) who live in several project locations.[45] A *masyarakat hukum adat* development plan (MHADP) was prepared for one representative subproject, and the indigenous peoples planning framework will guide the preparation and implementation of the MHADPs for other subprojects (farmers' ponds and capacity building).[46] The MHADPs will detail the magnitude of the project's impact on indigenous peoples, including (i) customary rights of use and access to land and natural resources; (ii) socioeconomic status; (iii) cultural and communal integrity; (iv) health, education, livelihood, and social security status; (v) vulnerability status; and (vi) recognition of indigenous peoples by the government and society. Meaningful consultations will be conducted with the customary communities to ensure that they participate in the planning, implementation, and monitoring of project activities. Project activities will avoid customary land to prevent conflicts. Customary community members located in subproject areas will be beneficiaries, and their participation will be closely monitored. The project will establish a grievance redress mechanism in each subproject area, and its components and procedures will be translated and disclosed to the affected communities.

41. **Safe working under COVID-19 conditions**. The impact of COVID-19 continues and is likely to remain a risk throughout project implementation. The implementation will be responsive and flexible in meeting emerging needs and will employ best practices during construction. The executing and implementing agencies, consultants, and contractors will incorporate best practices

[40] Environmental Assessment and Review Framework (accessible from the list of linked documents in Appendix 2).
[41] The project will exclude any subprojects that trigger categories A or B for involuntary resettlement.
[42] These facilities will be located on government owned lands. Safeguards Due Diligence Report (accessible from the list of supplementary documents in Appendix 2).
[43] Works include rehabilitation of irrigation canals and farm roads, upgrading of ponds with wastewater treatment facilities, and installation of electricity poles.
[44] Community Development Framework (accessible from the list of supplementary documents in Appendix 2).
[45] Subprojects with significant negative impacts on indigenous peoples (category A) will be excluded.
[46] Masyarakat Hukum Adat Development Plan (accessible from the list of linked documents in Appendix 2); and Indigenous Peoples Planning Framework (accessible from the list of linked documents in Appendix 2).

for managing COVID-19 risk, especially for work in confined spaces where the risk of transmission is high, in compliance with the government's regulations.

G. Summary of Risk Assessment and Risk Management Plan

42. Significant risks and mitigating measures are summarized in Table 5 and described in detail in the risk assessment and risk management plan.[47]

Table 5: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Farmers are reluctant to maintain sustainable aquaculture practices.	The project will (i) ensure that selected farmers provide to the Ministry of Marine Affairs and Fisheries a written commitment to implement sustainable aquaculture practices, (ii) conduct an awareness campaign to demonstrate the long-term benefits of sustainable aquaculture, and (iii) provide continuous technical support to farmers through facilitators and extension workers.
Late budget approval may delay payments to contractors and incur interest due on late payments.	The project will (i) update, on a regular basis, a standard contract monitoring table; and (ii) ensure that Ministry of Marine Affairs and Fisheries will submit a budget request for yearly budget allocation in a timely manner.
Lack of understanding and experience with requirements of the Asian Development Bank, and limited financial management staff resources, affect project performance and compliance.	The project's financial management consultants will train and support staff of the Directorate General of Aquaculture and the technical operating units in preparing financial data and consolidating the project's financial reports in a timely and accurate manner. A comprehensive financial management manual will be developed that sets out specific processes and internal controls to facilitate timely and accurate reporting.

Source: Asian Development Bank.

IV. ASSURANCES

43. The government and MMAF have assured ADB that implementation of the project shall conform to all applicable ADB requirements, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, financial management, and disbursement as described in detail in the PAM and loan documents. The government and MMAF have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreement.

V. RECOMMENDATION

44. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of ¥13,940,700,000.00 to the Republic of Indonesia for the Infrastructure Improvement for Shrimp Aquaculture Project, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's Flexible Loan Product; for a term of 18 years, including a grace period of 7.5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board.

Masatsugu Asakawa
President

18 November 2022

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

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with:
Contribution of the fisheries industry to the national economy increased (National Medium-Term Development Plan, 2020-2024)[a]

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
Outcome Productivity, profitability, and environmental sustainability of shrimp aquaculture increased	**By 2028:** a. Yield of shrimp farming increased to 3.0 tons/ha/year for farms upgraded by the project (2022 baseline: 0.6 tons/ha/year) (OP 5.3) b. Farmer exchange rate[b] increased to 107 for farms upgraded by the project (2020 baseline: 100) (OP 1.3) c. Environment sustainability improved for 5,260 ha of ponds[c] (2022 baseline: 0) (OP 3.3.1)	a–c. Project baseline and impact evaluation surveys, annual reports by MMAF and BAPPENAS	R: Extreme climate-linked disasters, hazards, and/or the COVID-19 pandemic will affect shrimp aquaculture development
Outputs 1. Quality and sustainability of inputs for shrimp production increased	**By 2027:** 1a. A modern broodstock center with a capacity of 500,000 broodstock/year constructed, with disaster–resilient, gender-responsive, and gender-inclusive design features[d] (2022 baseline: 0) (OP 2.5.2, OP 5.3.2) 1b. Two multiplication centers with a capacity of 2 billion shrimp nauplii/year constructed, with disaster–resilient, gender-responsive and gender-inclusive design features[d] (2022 baseline: 0) (OP 2.5.2, OP 5.3.2) 1c. Seven modern laboratories constructed with disaster resilient, gender-responsive, and gender-inclusive design features[d] (2022 baseline: 0) (OP 2.5.2, OP 3.2.5) 1d. At least 30 MMAF staff (at least 20% of whom are women) report having advanced competence in operating broodstock and multiplication centers and laboratories (2022 baseline: 0) (OP 2.1.1) 1e. At least 35,000 farmers (at least 20% of whom are women) report having basic competence for GERPARI (2022 baseline: 0) (OP 2.1.1, OP 5.3.2)	1a.–1e. Project progress reports and surveys .	R: Inadequate financing of O&M leads to premature deterioration of infrastructure

Results Chain	Performance Indicators	Data Sources and Reporting Mechanisms	Risks and Critical Assumptions
2. Sustainable and climate adaptive aquaculture infrastructure and services developed[e]	2a. At least 521 farmers' groups established and strengthened, of which at least 20% have women on their committees (2022 baseline: 0) (OP 2.3, OP 5.2) 2b. At least 521 sustainable aquaculture development plans prepared with specific measures for women farmers (2022 baseline: 0) (OP 5.2)[f] 2c. 5,260 ha of ponds equipped with wastewater treatment facilities (2022 baseline: 0) (OP 1.3.1) 2d. 50,000 mangrove saplings replanted (2022 baseline: 0) (OP 3.3.4) 2e. At least 35,000 farmers (at least 20% of whom are women) report increased financial literacy and greater knowledge of climate resilient and sustainable aquaculture (2022 baseline: 0) (OP 2.1.1, OP 3.2) 2f. MMAF's aquaculture asset management information system operationalized (2022 baseline: system piloted) (OP 1.3.1)	2a.–2f. Project progress reports and surveys	
3. Shrimp aquaculture supply chain strengthened	3a. At least 35,000 farmers (at least 20% of whom are women) report improved knowledge on handling practices, certification and traceability (STELINA), quality assurance systems, and food safety of aquaculture products (2022 baseline: 0) (OP 2.1.1) 3b. National regulations to support sustainable aquaculture issued by the Directorate General of Aquaculture (2022 baseline: 0) (OP 3.3.2) 3c. STELINA traceability system implemented in project area (2022 baseline: none) (OP 5.2.4) 3d. MMAF's geospatial database upgraded with sex-disaggregated data and a checklist of information related to human welfare, including gender-integrated information (2022 baseline: not applicable) (OP 2.3.2)	3a.–3d. Project progress reports; post-training assessments	

Key Activities with Milestones

1. Quality and sustainability of inputs for shrimp production increased

1.1 Review basic designs for the broodstock and multiplication centers[g] (Q2 2023)
1.2 Prepare detailed engineering designs for the broodstock and multiplication centers (Q4 2023)
1.3 Procure equipment and civil works, and supervise construction works (Q1 2025)
1.4 Conduct training programs for laboratory staff (Q2 2025)
1.5 Conduct training on GERPARI for farmers (Q2 2025)
1.6 Disseminate regulations and guidelines related to broodstock and feed production (Q4 2023)
1.7 Prepare O&M plans for the facilities built under the project and train MMAF staff and farmers (Q2 2025)

2. Sustainable and climate adaptive aquaculture infrastructure and services developed

2.1 Support smallholders in establishing farmers' groups (Q1 2026)
2.2 Prepare sustainable aquaculture development plans based on ecosystem; infrastructure, socio-economic, and institutional needs; and market demand (Q4 2025)
2.3 Prepare detailed engineering design and social and environmental safeguard documents for sustainable production ponds and associated infrastructure and mangrove replanting (Q4 2024)
2.4 Procure equipment and civil works packages (Q3 2025)
2.5 Supervise construction works (Q1 2026)
2.6 Conduct training programs on climate adaptive and sustainable aquaculture (Q1 2027)
2.7 Develop the asset management information system and prepare O&M plans for the facilities built under the project (Q2 2025)

3. Shrimp aquaculture supply chain strengthened

3.1 Conduct training programs for broodstock management, disease management, and food safety (Q4 2024)
3.2 Review and prepare recommendations for rationalizing and improving regulations for sustainable aquaculture (Q2 2024)
3.3 Operationalize STELINA traceability system (Q1 2023)
3.4 Conduct a campaign to inventory and register broodstock and feed producers, farmers, aggregators, and processors in the MMAF system (INDOGAP) (Q4 2025)
3.5 Upgrade MMAF geospatial database, including gender data, and analyze information to inform future investments in the industry (Q3 2023)

Project Management Activities

Complete baseline study (Q2 2023)
Design and roll out project monitoring and evaluation, and grievance redress system (Q2 2023)
Conduct project completion survey (Q4 2027)

Inputs

Asian Development Bank: ¥13,940,700,000 (loan) ($93.0 million equivalent)
Government of Indonesia: ¥1,666,165,425.14 ($11.1 million equivalent)

BAPPENAS = Ministry of National Development Planning, GERPARI = Gerakan Pakan Ikan Mandiri (national fish feed self-sufficiency program), ha = hectare, INDOGAP = Indonesian Good Aquaculture Practices, MMAF = Ministry of Marine Affairs and Fisheries, O&M = operation and maintenance, OP = operational priority, Q = quarter, R = risk, STELINA = *sistem telusur dan logistik ikan nasional* (national fish traceability and logistical system).

[a] Government of Indonesia. 2019. *National Medium-Term Development Plan (RPJMN) 2020–2024*. Jakarta.

[b] The farmer exchange rate (NTP) is a proxy indicator for farmers' welfare and measures the ability of farmers to exchange products they sell with those they need for production and household consumption. An NTP of 100 means that the farmer's income is the same as their expenses. An NTP higher than 100 means that the farmer has a surplus income, while an NTP below 100 means that the farmer's expenses are greater than their income.

[c] Environmental sustainability will be measured by a matrix combining level of key effluents and ecosystem conditions aligned with MMAF standards.

[d] Gender-responsive and gender-inclusive features include, but are not limited to, lactation rooms, separate toilets for men and women, and separate prayer rooms for men and women.

[e] Output 2 is aligned with the climate-smart aquaculture approaches of the Food and Agriculture Organization of the United Nations: "sustainably increasing output productivity and efficiency within the sector; reducing the sector's vulnerability and increasing its resilience to change; and reducing and removing greenhouse gases from within the sector." *Climate-Smart Agriculture Source Book. Module 10: Climate Smart Fisheries and Aquaculture*.

[f] Specific measures for women farmers will be identified during project implementation. Women may need specialized

training, equal access to land, financing and collateral, childcare and customized support to ease their workload as farmers and caregivers. Proper resources could help rural women to maximize economic opportunities; increase productivity; and improve food security, education, and healthcare, since women tend to reinvest in their households.

[g] The Oceanic Institute of Hawaii will conduct the review.

Contribution to Strategy 2030 Operational Priorities

Expected values and methodological details for all OP indicators to which this operation will contribute results are detailed in “Contribution to Strategy 2030 Operational Priorities” (accessible from the list of linked documents in Appendix 2). In addition to the OP indicators tagged in the design and monitoring framework, this operation will contribute results for

OP 3.3: People benefiting from strengthened environmental sustainability (5,210).

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=55020-001-3

1. Loan Agreement
2. Sector Assessment (Summary): Agriculture, Natural Resources, and Rural Development – (Fisheries [Shrimp Aquaculture])
3. Project Administration Manual
4. Economic and Financial Analysis
5. Summary Poverty Reduction and Social Strategy
6. Risk Assessment and Risk Management Plan
7. Contribution to Strategy 2030 Operational Priorities
8. Climate Change Assessment
9. Gender Equality and Social Inclusion Action Plan
10. Initial Environmental Examination
11. Environmental Assessment and Review Framework
12. Masyarakat Hukum Adat Development Plan
13. Indigenous Peoples Planning Framework

Supplementary Documents

14. Safeguards Due Diligence Report
15. Community Development Framework
16. Financial Management Assessment
17. Strategic Procurement Plan Report
18. Climate Risk and Adaptation Assessment
19. Sector Assessment: Agriculture, Natural Resources, and Rural Development – Shrimp Aquaculture
20. Feasibility Study
21. Poverty, Gender Equality, and Social Impact Assessment
22. Sustainable Aquaculture Development Plan (Sinjai District, South Sulawesi Province)
23. Sustainable Aquaculture Development Plan (Kedung Subdistrict, Jepara District, Central Java Province)