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Report No: PAD5340

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED LOAN

IN THE AMOUNT OF US$600 MILLION

TO THE

REPUBLIC OF THE PHILIPPINES

FOR A

# PHILIPPINE RURAL DEVELOPMENT PROJECT SCALE-UP

June 7, 2023

Agriculture And Food Global Practice
East Asia And Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective May 31, 2023)

| | |
|---|---|
| Currency Unit = | PhP |
| PhP 56.26 = | US$1 |

FISCAL YEAR
January 1 - December 31

| | |
|---|---|
| Regional Vice President: | Manuela V. Ferro |
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ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AFMP | Agriculture and Fisheries Modernization Plan |
| AM | Accountability Mechanism |
| BCR | Benefits-cost ratio |
| BARMM | Bangsamoro Autonomous Region in Muslim Mindanao |
| CERC | Contingent Emergency Response Component |
| COA | Commission on Audit |
| CPF | Country Partnership Framework |
| CRVA | Climate Resiliency Vulnerability Assessment |
| DA | Department of Agriculture |
| DCF | Data capture forms |
| DTI | Department of Trade and Industry |
| DPWH | Department of Public Works and Highways |
| EFA | Economic and financial analysis |
| EIRR | Economic internal rate of return |
| ENPV | Economic net present value |
| ERR | Economic rate of return |
| ESF | Environmental and Social Framework |
| eVSA | Expanded Vulnerability and Suitability Analysis |
| EX-ACT | Ex-Ante Carbon Balance Tool |
| F2C2 | Farm and Fisheries Clustering and Consolidation Program |
| FAO | Food and Agriculture Organization of the United Nations |
| FCA | Farmer cooperatives and associations |
| FIRR | Financial internal rate of return |
| FishCore | Fisheries and Coastal Resiliency Project |
| FM | Financial management |
| FMR | Farm-to-market road |
| FNPV | Financial net present value |
| FSDF | Food Security Development Framework |
| GCRF | Global Crisis Response Framework |
| GDP | Gross domestic product |
| GHG | Greenhouse gas |
| GIZ | German Agency for International Cooperation |
| GoP | Government of the Philippines |
| GRS | Grievance Redress Service |
| I-BUILD | Intensified Building-Up of Infrastructure and Logistics for Development |
| I-PLAN | Investments for Planning at the Local and National Levels |
| I-REAP | Investment in Rural Enterprise and Agriculture and Fisheries Productivity |
| IBRD | International Bank for Reconstruction and Development |
| IFR | Interim financial report |
| IMA | Implementation management agreement |
| InfoAce | Information, advocacy, communication and education |
| LGU | Local Government Unit |
| M&E | Monitoring and evaluation |
| MAFAR | Ministry of Agriculture, Fisheries and Agrarian Reform |

| | |
|---|---|
| MDS | Modified disbursement system |
| MEL | Monitoring, evaluation and learning |
| MIADP | Mindanao Inclusive Agriculture Development Project |
| MIS | Management information system |
| MOA | Memorandum of agreement |
| MRDP | Mindanao Rural Development Project |
| $N_2O$ | Nitrous oxide |
| NAFMIP | National Agriculture and Fisheries Modernization and Industrialization Plan |
| NFC | Northern Foods Corporation |
| NGAS | National Government Accounting System |
| NGO | Non-governmental organization |
| NPAB | National Project Advisory Board |
| NPCO | National Project Coordination Office |
| NPV | Net present value |
| NPSC | National Project Steering Committee |
| O&M | Operation and maintenance |
| PAFES | Provincial Agriculture and Fisheries Extension Service |
| PCIP | Provincial Commodity Investment Plan |
| PDO | Project Development Objective |
| PDP | Philippine Development Plan |
| PhP | Philippine Peso |
| POM | Project operations manual |
| PMIU | Project management and implementation unit |
| PP | Procurement plan |
| PPSD | Project Procurement Strategy for Development |
| PRDP | Philippine Rural Development Project |
| PSA | Philippine Statistics Authority |
| PSO | Project Support Office |
| RAFIP | Regional Agriculture and Fisheries Investment Portfolio |
| RFO | Regional Field Office |
| RPAB | Regional Project Advisory Board |
| RPCO | Regional Project Coordination Office |
| SES | Social and environmental safeguards |
| STEP | Systematic Tracking of Exchanges in Procurement |
| $tCO_2eq$ | Ton of $CO_2$ equivalent |
| TOC | Theory of Change |
| TTL | Task team leaders |
| UAV | Unmanned aerial vehicle |
| US$ | United States dollar |
| VCA | Value chain analysis |

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DATASHEET

## BASIC INFORMATION

| Country(ies) | Project Name | |
|---|---|---|
| Philippines | Philippine Rural Development Project Scale-up | |
| **Project ID** | **Financing Instrument** | **Environmental and Social Risk Classification** |
| P180379 | Investment Project Financing | Substantial |

### Financing & Implementation Modalities

| | |
|---|---|
| [ ] Multiphase Programmatic Approach (MPA) | [✓] Contingent Emergency Response Component (CERC) |
| [ ] Series of Projects (SOP) | [ ] Fragile State(s) |
| [ ] Performance-Based Conditions (PBCs) | [ ] Small State(s) |
| [ ] Financial Intermediaries (FI) | [ ] Fragile within a non-fragile Country |
| [ ] Project-Based Guarantee | [ ] Conflict |
| [ ] Deferred Drawdown | [ ] Responding to Natural or Man-made Disaster |
| [ ] Alternate Procurement Arrangements (APA) | [ ] Hands-on Enhanced Implementation Support (HEIS) |

| Expected Approval Date | Expected Closing Date |
|---|---|
| 29-Jun-2023 | 30-Jun-2029 |

Bank/IFC Collaboration

No

### Proposed Development Objective(s)

To improve farmers and fisherfolk access to markets and increase income from selected agri-fishery value chains

### Components

| Component Name | Cost (US$, millions) |
|---|---|

| | |
|---|---|
| Component 1: National and Local Level Planning Component (I-PLAN) | 15.00 |
| Component 2: Rural Infrastructure and Market Linkage Component (I-BUILD) | 644.63 |
| Component 3: Enterprise Development Component (I-REAP) | 111.37 |
| Component 4: Project Implementation Support Component (I-SUPPORT) | 47.40 |
| Component 5: Contingent Emergency Response Component (CERC) | 0.00 |

### Organizations

| | |
|---|---|
| Borrower: | Republic of the Philippines |
| Implementing Agency: | Department of Agriculture |

## PROJECT FINANCING DATA (US$, Millions)

### SUMMARY

| | |
|---|---|
| **Total Project Cost** | 818.40 |
| **Total Financing** | 818.40 |
| **of which IBRD/IDA** | 600.00 |
| **Financing Gap** | 0.00 |

### DETAILS

**World Bank Group Financing**

| | |
|---|---|
| International Bank for Reconstruction and Development (IBRD) | 600.00 |

**Non-World Bank Group Financing**

| | |
|---|---|
| Counterpart Funding | 216.17 |
| Borrower/Recipient | 216.17 |
| Commercial Financing | 2.23 |
| Unguaranteed Commercial Financing | 2.23 |

### Expected Disbursements (in US$, Millions)

| WB Fiscal Year | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|
| Annual | 0.00 | 46.40 | 40.24 | 35.44 | 56.31 | 142.84 | 167.74 | 111.03 |
| Cumulative | 0.00 | 46.40 | 86.64 | 122.08 | 178.39 | 321.23 | 488.97 | 600.00 |

## INSTITUTIONAL DATA

**Practice Area (Lead)**

Agriculture and Food

**Contributing Practice Areas**

Transport

**Climate Change and Disaster Screening**

This operation has been screened for short and long-term climate change and disaster risks

## SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

| Risk Category | Rating |
|---|---|
| 1. Political and Governance | Moderate |
| 2. Macroeconomic | Moderate |
| 3. Sector Strategies and Policies | Moderate |
| 4. Technical Design of Project or Program | Moderate |
| 5. Institutional Capacity for Implementation and Sustainability | Moderate |
| 6. Fiduciary | Substantial |
| 7. Environment and Social | Substantial |
| 8. Stakeholders | Moderate |
| 9. Other | Moderate |
| 10. Overall | Moderate |

## COMPLIANCE

### Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

### Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

| E & S Standards | Relevance |
|---|---|
| Assessment and Management of Environmental and Social Risks and Impacts | Relevant |
| Stakeholder Engagement and Information Disclosure | Relevant |
| Labor and Working Conditions | Relevant |
| Resource Efficiency and Pollution Prevention and Management | Relevant |
| Community Health and Safety | Relevant |
| Land Acquisition, Restrictions on Land Use and Involuntary Resettlement | Relevant |
| Biodiversity Conservation and Sustainable Management of Living Natural Resources | Relevant |
| Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities | Relevant |
| Cultural Heritage | Relevant |
| Financial Intermediaries | Not Currently Relevant |

**NOTE**: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

### Legal Covenants

Sections and Description

Institutional Arrangement: Loan Agreement, Schedule 2, Section I.A.2 Recurrent, Continuous

The Borrower, through the DA, shall: (i) establish, by not later than three (3) months after the Effective Date, and thereafter maintain a NPSC, to be responsible, inter alia, for approving policy and refinements of procedures as well as overall direction and oversight of Project implementation; (ii) maintain a NPCO, to be responsible, inter alia, for implementation of the overall institutional reforms planned for the DA under the Project and overall management and coordination of the relevant government agencies involved in the implementation of the Project; (iii) at regional level, maintain a RPAB to be responsible for approving Subproject proposals and for facilitating harmonization of approach and convergence at each region, maintain a RPCO within each respective DA regional field office, or within MAFAR in the case of BARMM, to be responsible, inter alia, for coordination and management of day-to-day Project implementation at the regional level, and maintain a PSO to be responsible, inter alia, for providing administrative, legal and technical support to the RPCOs; and (iv) at local level, prior to the commencement of any Project activity in each LGU, enter into a memorandum of agreement with each Participating LGU under terms and conditions acceptable to the Bank and setting out, among others, the agreed institutional arrangement and institutional strengthening action plan for the respective implementation of Project activity in each LGU.

Sections and Description
Institutional Arrangement: Loan Agreement, Schedule 2, Section I.A.3

The Borrower, through the DA, shall: (i) implement planning guidelines in coordination with relevant technical and attached agencies of the DA; (ii) provide support to RFOs in the implementation of the relevant PCIP; and (iii) make appropriate provisions in their annual budget for the same.

Sections and Description
Project Operations Manual: Loan Agreement, Schedule 2, Section I.B Recurrent, Continuous

The Borrower, through the DA, shall: (i) ensure that the Project is carried out in accordance with the arrangements and procedures set out in the POM (in the event of any conflict between the POM and the provisions of the Loan Agreement, the provisions of the Loan Agreement shall prevail); and (ii) notamend, abrogate or waive any provision of the POM unless the Bank has provided its prior no-objection thereof in writing.

Sections and Description
Annual Work and Financial Plans: Loan Agreement, Schedule 2, Section I.C Recurrent, Continuous

The Borrower, through the DA, shall: (i) prepare and furnish to the Bank for its no-objection not later than [October 31] of the Borrower's fiscal year during the implementation of the Project (or such later date as the Bank may agree), a consolidated Annual Work and Financial Plan ("AWFP"); (ii) ensure that the Project is implemented in accordance with the AWFP (in the event of any conflict between the AWFP and the provisions of the Loan Agreement, the provisions of the Loan Agreement shall prevail); and (iii) not make or allow to be made any change to the AWFP without prior no-objection in writing by the Bank.

Sections and Description
Contingent Emergency Response: Loan Agreement, Schedule 2, Section I.F In case of an Eligible Crisis or Emergency

The Borrower, through the DA, shall ensure that: (i) a manual ("CERC Manual") and Emergency Action Plan are prepared and adopted for implementation of Part 5 of the Project in form and substance acceptable to the Bank; (ii) in the event of an Eligible Crisis or Emergency, ensure that the activities under said part are carried out in accordance with such CERC Manual, Emergency Action Plan and all relevant environmental and social requirements; and (iii) not amend, suspend, waive or abrogate, repeal or waive any provisions of the CERC Manual and/or Emergency Action Plan unless the Bank agrees otherwise in writing.

Sections and Description
Environmental and Social Standards: Loan Agreement, Schedule 2, Section I.D Recurrent, Continuous

The Borrower, through the DA, shall (i) ensure that the Project is implemented in accordance with the Environmental and Social Standards, Environmental and Social Commitment Plan ("ESCP") (including the management tools and instruments referred to therein), in a manner acceptable to the Bank; and (ii) not amend, repeal, suspend or waive any of their provisions unless the Bank agrees otherwise, and report on their status of implementation with the frequency specified in the ESCP.

Sections and Description
Subprojects: Loan Agreement, Schedule 2, Section I.E Recurrent, Continuous

The Borrower, through the DA, shall enter into an Implementation Management Agreement with each Implementing Proponent (selected in accordance with the eligibility criteria set out in the Project Operations Manual to participate in Project) under terms and conditions acceptable to the Bank for the carrying out of the respective Subprojects.

Sections and Description
Mid-term Review: Loan Agreement, Schedule 2, Section II.B Once, on or about 30 months after the Effective Date

The Borrower, through the DA, shall: (i) furnish to the Bank a mid-term project progress report on or about the date 30 months after the Effective Date; and (ii) carry out the necessary actions identified in the mid-term report after the submission.

Sections and Description
Personal Data: Loan Agreement, Schedule 2, Section II.C Recurrent, Continuous

In sharing any information, report or document related to the activities described in Schedule 1 of the Loan Agreement, the Borrower, through the DA, shall ensure that such information, report or document does not include Personal Data unless otherwise explicitly requested by the Bank or permitted under the Loan Agreement.

**Conditions**

| Type | Financing source | Description |
|---|---|---|
| Effectiveness | IBRD/IDA | Loan Agreement, Article [4.01]:<br>The Borrower, through the DA, has adopted the Project Operations Manual, in form and substance acceptable to the Bank. |
| Type | Financing source | Description |
| Disbursement | IBRD/IDA | Loan Agreement, Schedule 2, Section III.B.1.(b):<br><br>For Emergency Expenditures under Category [(2)]:<br>(i) (A) the Borrower has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Bank a request to withdraw Loan amounts under Category [(2)]; and (B) the Bank has agreed with such determination, accepted said request and notified the Borrower thereof; and<br>(ii) the Borrower has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Bank. |

# I. STRATEGIC CONTEXT

## A. Country Context

1. **Over the past decade, the Philippines has been among the most dynamic economies in the East Asia Pacific region. In recent years, structural reforms have led to a significant reduction in poverty.** The country has successfully pursued policies and reforms that accelerated economic growth during a period of relative political and macroeconomic stability. The result was that the Philippines' growth rate increased by an average of 6.4 percent per year from 2010 to 2019, driven mainly by services and industry. Such growth is a significant increase from the 4.6 percent average over the previous decade. At the time, the country's economic performance surpassed that of its peers in the region, such as Vietnam (6.3 percent), Indonesia and Malaysia (5.4 percent), and Thailand (3.6 percent). However, in 2020, the Philippines saw its worst contraction in its post-war history, shrinking by 9.5 percent due to the triple shock of the COVID-19 pandemic, which delivered a historical global recession, a health crisis, and containment measures that stifled the domestic economy. The Philippines has since rebounded strongly, growing by 5.7 percent in 2021 and 7.6 percent in 2022 as the economy fully reopened.

2. **Before the COVID-19 pandemic, the Philippine economy had made good progress in delivering inclusive growth.** Poverty levels fell from 23.3 percent in 2015 to 16.6 percent in 2018. However, by the first semester of 2021, the poverty incidence had risen to 23.7 percent, equivalent to about 26.14 million poor Filipinos. Some 7.1 percent of families did not earn enough to meet their basic food needs, based on a monthly food threshold of PhP8,393 per day, or roughly US$5 per day (PSA 2021). Food and nutrition security concerns remain pervasive, with food prices in the Philippines increasing by 9.3 percent year-on-year as of March 2023 . Rising food prices are mainly due to: (a) global commodity price hikes, including for food imports and agricultural inputs, due to disruptions from Russia's invasion of Ukraine; (b) agricultural production losses due to weather disturbances; (c) slumps in local meat production due to flare-ups of the African swine fever and the higher cost of animal feed; (d) currency depreciation and import delays; and (e) inadequate transport and logistics, especially the lack and poor state of farm-to-market roads (FMRs) which restrict the expansion of agricultural value chains and cause considerable supply-side inefficiencies.

3. **The population of the Philippines is relatively young, with only 5 percent of its roughly 107 million people aged 65 years and older (World Bank 2019a)**. Adult literacy is high, reaching 98 percent in 2015, and the average life expectancy in 2018 was estimated at 71 years. However, current trends reveal mixed human capital outcomes that undermine the wellbeing and productivity of current and future generations (World Bank 2019b). Primary producers remain the poorest among the basic sectors[1]. Nearly 60 percent of the poor work in agriculture, twice the national average and three times the ratio of the non-poor. As such, the pace and nature of the agriculture and fishery sector's growth will be pivotal for the country's overall development.

## B. Sectoral and Institutional Context

4. **Agriculture provides 22.9 percent of total employment and 9.1 percent of the Gross Domestic Product (GDP).** While the overall economy has remained on a sustained growth trajectory, apart from the dip during the COVID-19 pandemic, growth in the agriculture sector has remained low at around 1.3 percent. Total factor productivity (TFP) in

[1] Based on the data from the Philippine Statistics Authority (2021), poverty incidence among farmers and fisherfolk has decreased from 40.8 percent (2015) to 31.6 percent (2018), and 36.9 percent (2015) to 26.2 percent (2018), respectively.

agriculture has risen by about 32 percent over two decades, but this has fallen short of TFP growth in neighboring Vietnam (73 percent), Indonesia (50 percent), and Thailand (67 percent). One key contributing factor has been the low productivity of rice despite the significant resources and policy attention given to its production. Another key factor has been the slow pace of diversification to higher-value products for local consumption and export. The share of high-value crops in Philippine agriculture in terms of overall value added has risen only slightly over the last two decades, from 19.6 to 20.6 to 22.9 percent in 2000, 2018, and 2019, respectively (World Bank 2020).

5. **Reforms in agricultural policies over the past few years have spurred some growth in the sector, but this has fallen short of bringing about significant structural transformation and dynamic development.** A compounding factor is the country's geography[2], which comprises over 7,000 islands and presents significant logistical issues for transporting agricultural commodities and trade[3]. The country is a net importer of cereals, poultry meat, dairy products, and protein meal, and increasingly relies on imports to ensure sufficient food supply and stable prices. The total value of the country's agricultural imports is roughly double its agricultural exports. Rising incomes, increasing urbanization, a growing upper and middle class, and a fast-changing lifestyle have driven the steady growth of the food retail sector. The sector grew by 19 percent between 2016 and 2021, from US$20.44 billion to US$24.36 billion (USDA 2022). Consumers are beginning to shift from traditional outlets like wet markets and traditional stores to modern food retail markets, such as supermarkets and convenience stores. While e-commerce still represents a small portion of the market, it is a fast-growing marketing channel. E-commerce's value increased from US$2 million in 2018 to US$738 million in 2021 or a real value of US$1.82 million in 2018 to US$665.49 million in 2021 (USDA 2021, 2022). Despite aggressive expansion by modern food retailers, the retail market is far from saturated and traditional outlets still dominate the food retail market, accounting for 58 percent of sales (USDA 2019a).

6. **Agricultural production also fluctuates yearly, largely due to extreme weather events.** Adverse weather frequently damages crops, livestock, and rural infrastructure, such as irrigation canals, postharvest facilities, and rural roads. Adverse weather also disrupts the logistics of agriculture products and supplies. From 2010 to 2019, damage from natural extreme events and disasters in the Philippines amounted to PhP 463 billion, of which 62.7 percent or PhP 290 billion was in the agriculture sector (PSA 2020). Increasing temperatures also affect crop and livestock yields, foster pest outbreaks, and reduce labor productivity. By 2050, estimates suggest that climate change will decrease agricultural productivity in the Philippines by 9 to 21 percent (Gevaña et al. 2019). Increasing temperature and ocean acidification are also affecting fishery productivity. Sea-based hazards from sea-level rise, storm surges, and saltwater intrusion will also significantly impact coastal and freshwater fisheries, particularly in the marginalized coastal communities of the Visayas and Mindanao (Alliance of Biodiversity International and CIAT and WFP 2021). These, in turn, will increasingly contribute to risks of food deficits, food insecurity, and social and economic disruption. Given the acute exposure of the agricultural sector, rural communities are especially at risk. The Philippines is also highly vulnerable to pandemic risks and incursions of emerging infectious diseases, zoonoses, and transboundary animal diseases from human and animal migration, trade, and tourism. The Foodborne Disease Burden Epidemiology Reference Group estimates that animal-sourced foods cause about 55 percent of foodborne illnesses in the country. Annual productivity loss due to foregone work, disability, and premature death is estimated to cost around US$1.5 billion (World Bank 2020). Recurring animal health issues such as African swine fever and avian flu have posed substantial challenges to food safety and security. The Philippines is addressing these threats by institutionalizing the

[2] The Philippines is grouped into three main geographical areas: Luzon, Visayas, and Mindanao. Among these groups, Luzon accounts for 39.2 percent of agriculture production, Mindanao 33.4 percent and Visayas 27.4 percent.

[3] The Philippines experiences substantial post-harvest losses ranging from 30 to 60 percent through poor on-farm harvesting, grading, and packing, as well as through lengthy and inappropriate transportation from field to warehouses, inadequate cool storage, the need for regrading and repackaging, etc.

One Health approach[4] and strengthening coordination mechanisms between human, animal, and environmental health systems.

7. **Underinvestment in the agri-fishery sectors relative to other sectors remains an ongoing concern.** Underinvestment stems from a legacy of poor planning and prioritization, an unfavorable business climate, entry barriers, and numerous coordination failures. Local Government Units (LGUs) also underbudget for the operation and maintenance (O&M) of existing FMR infrastructure (World Bank 2010). Meanwhile, the business climate suffers under a complex, fragmented regulatory system that raises cargo service transaction costs (Llanto and Quimba 2021). Inadequate and inefficient port facilities often lead to congestion during peak seasons (Mataia et al. 2020). This partly arises from a conflict of interest: the port regulator, the Philippine Ports Authority, also functions as a government-owned and controlled corporation and earns income from port operations. Additional logistical costs for shipping companies, traders, and importers arise from informal fees collected by LGUs, complex road and ship transport licensing requirements, and historical caps on foreign equity investment (OECD 2020). Coordination failures, such as the non-standardization of produce, also hinder investment in large-scale processing. At the same time, farmers and traders have little incentive to improve product quality due to the small premium paid for higher-quality products in traditional markets. Such coordination failures account for the very high numbers of market players and multiple layers in trading, processing, and distribution. Together with high logistical service margins, this translates into lower profit margins, mostly passed on to producers.

8. **Logistical inefficiencies are particularly severe for agribusiness. Products are sourced over a wide inter-island landscape, and postharvest losses range from 30 to 60 percent.** Logistics is a relatively high-cost service in the Philippines. The share of logistics costs to sales is 27 percent, compared with Indonesia at 21 percent, Vietnam at 16 percent, and Thailand at 11 percent. Within the transport subset of logistics, the highest cost is for road transport at 40 percent, while maritime transport accounts for 35 percent of costs. The most recent rice value chain case study found rice has similar logistical constraints to other commodities (Mataia et al. 2020). These include: (a) large variations in the quality of produce; (b) high transport expenses across the value chain, where the share of transport expense to marketing cost ranges from 17 percent for transport to rice mills, to around 32 percent for produce procurement and rice retailing; (c) limited drying and storage facilities; (d) unavailability and high cost of working capital, at 14–17 percent of marketing cost at the wholesale/retail level; and (e) high processing costs, owing to underutilization and prevalence of smaller and older processing equipment. Over the longer term, substantial public investment is needed for rural infrastructure, especially all-weather FMRs, to enable more efficient market access.

9. **Gender inequality remains pervasive in rural areas**. A Food and Agriculture Organization (FAO) study (2018) reported significant inequalities for Filipino women at the household and community levels in rural areas. Such disparities were mostly due to prevailing societal and cultural norms. Gender inequality continues to exist despite the enactment of enabling policies, guidelines, and mechanisms to close the country's gender gap. Enhancing women's roles in agriculture is also one of the four priorities of the World Bank's Philippines Country Gender Action Plan for FY20–24. While rural employment accounts for about 30 percent of the country's total employment, the work force is predominantly male, at 78 percent (PSA 2021). However, official data may not accurately capture women's work in agriculture, as it is normally considered an extension of their household tasks and is, therefore, not reported as 'work'. The gender inequality has contributed to women's limited access to financial services, technology, and other productive resources. As illustrated by 2017 data of the Department of Agriculture (DA), of those benefiting from

[4] One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of humans, animals, plants, and ecosystems. One Health recognizes that the health of humans, domestic and wild animals, and the environment, including ecosystems, are closely linked and interdependent.

technical services through regular DA programs, only 27 percent were women[5]. Women are less likely to be targeted for extension services, and this in turn has inhibited their capacity to participate or take leadership roles in agricultural value chains activities.

10. **Against this background, the Philippine Development Plan (PDP) 2023–2028 and the National Agri-Fishery Modernization and Industrialization Plan (NAFMIP) 2021–2030 call for significant transformative changes.** Several key strategies embodied in NAFMIP 2021–2030 are designed to accelerate agri-fishery sectoral transformation. These strategies include: (a) adopting a "whole value chain" approach that considers agri-fishery from production, through processing, marketing, and consumption, to waste management; (b) restoring the local food culture toward improving agri-food system resiliency, empowering farmers, and linking agri-fishery production to consumer nutrition and health of the environment; and (c) opening up more opportunities in the blue economy to leverage the country's vast coastal and marine resources and maritime domain. The Rice Liberalization Act (RA 11203), which abolished the import quota system, indicates the strategic shifts underway. The act opened up the importation of rice to private traders and limited the mandate of the National Food Authority to domestic procurement of palay (unhusked rice) from farmers and the maintenance of national rice strategic rice reserves. This reform was an important step towards leveling the playing field for non-rice agriculture. A further transformational change is expected through the Mandanas ruling, under which the central government intends to devolve more responsibilities for administering and funding projects and programs to LGUs.

11. **The Philippines has widely adopted a "whole value chain" approach to agri-fishery production**. Commodity roadmaps have been developed and are accessible online for 20 major commodities in the Philippines. These roadmaps provide information and analyses of all aspects of the value chain, i.e., supply, logistics, marketing value addition, and export. The roadmaps also provide blueprints for industrializing these commodities. The whole value chain approach also indicates the importance of adopting global standards for product quality and food safety by improving the detection and control of agricultural pests and diseases, and strengthening local veterinary services. However, operational strategies and programs to prioritize and support the development of agri-fishery value chains and market linkages for farmers need strengthening. These difficulties are compounded by the agri-fishery sectors being dominated by small-scale, individual producers, with limited opportunities for achieving the economies of scale needed to raise profitability, invest in advanced technology, and incentivize private sector investment. Collectively, these factors contribute to higher transaction costs, lower profitability, and poorer job quality and incomes in the agri-fishery sectors.

12. **The ongoing World Bank-supported Philippine Rural Development Project (PRDP, P132317) has successfully strengthened value chain analyses (VCA) and institutionalized their use by LGUs across the country.** The PRDP, described in Box 1, uses VCAs and edaphic and climate-based suitability criteria for DA's LGU planning and investment. Over the eight years of implementing PRDP, the project has successfully catalyzed the start-up and expansion of many micro-, small and medium-scale agri-fishery enterprises nationwide. The project's planning platform for DA-LGU joint investments, known as Provincial Commodity Investment Plans (PCIPs), is now mainstreamed and leverages support from other sources, particularly other government agencies. The project has also significantly improved the connectivity of production areas with markets through investments in FMRs. However, there is still a significant need for FMR and other rural infrastructure in the country. Initial estimates in the DA's FMR Network Map and Plan indicate the need for around 15,000+ kilometers of FMR with an estimated cost of PhP190 billion (US$3.45 billion). There is

[5] Similar findings were obsedved from the 2019 household survey conducted as part of a World Bank field study which interviewed around 500 household. Only 25 percent of rural women had access to production support services.

also the need to: (a) focus on fewer but larger outcome-based programs, i.e., scaling-up; (b) reorient commodity price and production support toward more public good investments, including research and development, infrastructure, markets and biosecurity; and (c) correct market failures and supply chain inefficiencies that reduce profitability for producers and agribusiness and impact food security.

**Box 1. Key Features of the PRDP**

The original loan for PRDP in the amount of US$501.25 million was fully blended with a Global Environment Facility (GEF) grant of US$7.0 million and approved on August 29, 2014. The First Additional Financing (AF1) of US$170 million was approved on January 11, 2018. This was followed by the Second Additional Financing (AF2) of US$280 million, blended with an EU grant of US$21.3 million equivalent. The original loan, the GEF grant and the AF1 closed on May 31, 2023. The AF2 loan is scheduled to close on July 31, 2025. The project development objective is "to increase rural incomes and enhance farm and fishery productivity in the targeted areas". The global environment outcome is "to strengthen the conservation of the coastal and marine resource base in targeted program areas."

An interim Implementation Completion and Results Report completed in 2020 found the project to be on track to achieve all its objectives. The PRDP is being implemented nationwide. Some 689 LGUs—including 587 municipalities and 23 cities across 79 of 82 provinces—have institutionalized PCIPs as the primary DA-LGU planning instrument. Enterprise support has led to the start-up or expansion of 706 agri-fishery enterprises—438 micro, 220 small, and 48 medium scale[6]—and supported 162,759 direct beneficiaries, of whom 48 percent are women. This has catalyzed a more business-oriented approach to agri-fishery production and greatly expanded public-private stakeholder collaboration.

To this point, the PRDP has also strengthened the connectivity of production areas with market centers by constructing some 324 climate-proof FMRs, totaling 2,380 kilometers, with an average length of 6.7 kilometers. The PRDP also supported the construction of 45 bridges and several postharvest facilities, all of which meet climate-proof standards of the Department of Public Works and Highways (DPWH). Through PRDP, the DA has also become the main agency responsible for providing FMRs and bridges. The DA has mainstreamed effective processes for ensuring their O&M by the LGUs.

These experiences and achievements have underpinned the design of the PRDP Scale-Up.

### C. Relevance to Higher Level Objectives

13. **The proposed project aligns with the goals of the PDP (2023–2028) to develop a competitive, sustainable, and technology-based agricultural sector that will contribute to inclusive growth and reduce poverty.** Modernizing the agri-food sector is a central strategy of the government's Ten-Point Socio-Economic Agenda, which highlights the following key actions: (a) ensuring greater national food security; (b) creating more jobs and fostering value addition; (c) increasing farmer incomes; (d) building greater resilience to climate change; and (e) contributing to peace and security in rural areas. The NAFMIP (2021–2030) elaborates on these strategies and specifically calls for transformative shifts in agri-fisheries to: (a) diversify incomes and employment of smallholder farmers and fisherfolk; (b) articulate the often underrated and implicitly defined role of urban and peri-urban areas in agri-fishery growth; (c) optimize synergistic impacts using a spatial framework to focus investments geographically; and (d) match the supply and demand for food. This project will focus on promoting greater collaboration among national government agencies, LGUs, and private and non-government stakeholders, as part of the integrated paradigm.

[6] Micro: < PhP 3 million; Small: PhP 3–15 million; Medium: PhP15–50 million.

14. **The project also closely aligns with the World Bank Group's Country Partnership Framework (CPF 2019–23)[7] and its overarching objective of reducing constraints to inclusive growth and poverty reduction.** The CPF's Focus Area #2, Competitiveness and Economic Opportunity for Job Creation, seeks to promote "inequality-reducing transformation that will expand economic opportunities across sectors, from agriculture, forestry and fisheries to industry and services." In particular, the project will support Objective #7, to improve income opportunities in agriculture. The project will foster partnerships in productive investments between farmer groups and commercial buyers along agricultural supply chains, thereby contributing to improved market access and higher income opportunities for all stakeholders across the value chain. The project is also expected to contribute to CPF Focus Area #1: Investing in Filipinos, especially regarding the core priority of reducing the vulnerability of individuals and groups (priority # iii). The Project supports the Bank's Green, Resilient and Inclusive Development approach, including a range of climate adaptation and mitigation measures expected to generate significant climate co-benefits.The World Bank has invested over 20 years in supporting rural development in the Philippines through PRDP and its associated additional financing, as well as two Mindanao Rural Development Projects (MRDP 1 and 2).

15. **The project responds directly to the World Bank's Global Crisis Response Framework (GCRF) through Pillar 1 (Responding to Food Insecurity) and Pillar 4 (Strengthening Policies, Institutions and Investments for Rebuilding Better).** Component 1, supporting Pillar 4, operationalizes the NAFMIP and strengthens the DA's policies and investments. Components 1, 2 and 3 support Pillar 1 by supporting value chain infrastructure to strengthen the food supply chain and expanding rural agri-fishery enterprise cluster productivity to enhance food security and supply.

16. **The project will follow the principles of the World Bank Group's Fragile, Conflict and Violence (FCV) Strategy 2020–2025, particularly "inclusion".** It will pursue a people-centric approach in line with the "leave no one behind" principle. The PRDP Scale-Up will be implemented nationwide and support Pillar 3 in the FCV strategy, "Helping Countries Transition out of Fragility". In particular, the project will support two priorities identified in the FCV strategy: creating jobs and economic opportunities, and building community resilience and preparedness, especially in terms of climate change impacts and environmental degradation.

17. **The project is consistent with the World Bank Maximizing Finance for Development (MFD) framework. It seeks to optimize public resources by improving the conditions for private sector investment and mobilizing private capital**. The MFD-enabling activities under the project include: (a) participatory VCAs; (b) provincial commodity investment planning, and Regional Agriculture and Fisheries Investment Portfolios (RAFIPs) identifying opportunities for private investment; (c) specialized technical assistance and studies; (d) policy dialogue and reforms to remove bidding constraints for private sector investments; (e) investment in public infrastructure including FMRs to improve access to production hubs and markets; (f) subgrants in support of critical value chain technologies and infrastructures; (g) investments in systems and capacity of commercial lenders, producers' groups and agri-enterprises; and (h) improved access to commercial financing. The project will strengthen the enabling environment to maximize finance for development. It is expected to mobilize private sector financing through mobilizing cash equity from farmers' cooperatives and associations and commercial bank lending. Under Component 3, 20 percent of enterprise development proposals will be funded by proponent farmers' cooperatives and associations (FCAs) in cash and/or in kind. Additional support will be provided to promote and leverage private sector investment. Based on the PRDP experience, the mobilization of private capital is estimated to be at least US$2.23 million, possibly up to US$25 million. Given the project's demand-driven nature, the project cost (Table 1) presents only the lower scenario of US$2.23 million. However, the status of MFD mobilization and enabling outcomes will be monitored and reported

[7] CPF 2019–2023, (Report No.143605-PH) was discussed by the Board of Executive Directors on December 17, 2019. The Performance and Learning Review (Report No. 177313-PH) largely confirms the focus areas and most objectives of the CPF and extends it until December 2024.

annually to further refine approaches for mobilizing private capital.

## II. PROJECT DESCRIPTION

### A. Project Development Objective

18. **PDO Statement:** To improve farmers' and fisherfolks' access to markets and increase income from selected agri-fishery value chains.

19. **PDO-Level Indicators**
    - Farmers reached with agricultural assets or services (gender-disaggregated)
    - Percent increase in volume (metric tons) of products marketed
    - Percent increase in farmers' and fisherfolks' net incomes derived from commodities and product form (gender-disaggregated)

### B. Project Components

20. **The project aims to horizontally and vertically scale-up the current PRDP to address sectoral transformative changes envisioned in the PDP 2023–2028 and NAFMIP 2021-2030.** It has been designed as a flagship project that will allow the DA to continue to provide leadership, direction, and collaborative support across government agencies and the private sector to transform the agri-fishery sectors. It will be linked closely with other initiatives, particularly the DA's Farm and Fisheries Clustering and Consolidation Program (F2C2). Through F2C2, all DA bureaus and agencies are required to promote clustering, and focus technical service support to agri-fishery producer clusters and the still-evolving initiative to develop a Provincial Agricultural and Fishery Extension Service (PAFES). The extensive digitalization and web-based knowledge management initiated under PRDP will also be further developed, particularly focusing on institutional strengthening as described in Annex 1 and included in the Project Operations Manual (POM).

21. **The project will be horizontally and vertically scaled-up to support new enterprise and infrastructure subprojects across all 82 provinces in the country.** It will maintain the well-structured implementation framework and the well-established components used for PRDP to provide public infrastructure and enterprise support. This approach will help implement and build upon established operational and administrative procedures. The project will also be vertically scaled-up through: (a) strengthening inclusive connectivity and integration of agriculture value chains with more focus on larger enterprise and on post-production segments of value chains; (b) providing incentives to attract more private sector investments; (c) taking a more holistic approach to food security by fostering convergence with other programs in the country; (d) providing more support for building climate resilience; (e) focusing more on narrowing gender gaps; (f); further strengthening the institutional mechanism and LGU capacity on oversight, fiduciary and safeguards; and (g) ramping up integration of digitalization and knowledge management. Additionally, the PRDP Scale-Up will more systematically facilitate access to credit and insurance. During implementation, the project will explore further ways to strengthen insurance coverage for producers and enterprises in conjunction with reforms to the Philippine Crop Insurance Corporation planned for inclusion in the forthcoming First Sustainable Recovery Development Policy Loan (P178634, expected to be approved in June 2023). These efforts will be complemented through planned World Bank technical assistance to: (a) enhance the protection of small and marginal subsistence farmers from losses and damages due to disasters and calamities; (b) improve the targeting of smallholders; and (c) develop new products which better meet the needs of small and vulnerable farmers. The project will also improve the

nutritional quality of food through interventions that reduce postharvest losses, improve handling to prolong shelf-life and product quality, and promote cultural practices designed to limit improper chemical usage. As such, it will complement the recently approved World Bank-supported Philippines Multisectoral Nutrition Project (P175493, closing on June 30, 2026).

22. **The project will also support a range of climate adaptation and mitigation measures expected to generate significant climate co-benefits, as detailed in Annex 4.** The project aligns with the Paris Agreement (2015) and the Philippine's Nationally Determined Contributions (NDCs) (2021). Investment planning mechanisms will be enhanced to include physical climate risks and resilience information, criteria, and standards that encompass subproject design, site selection, and decision-making. This will build on climate risk and resiliency assessments already in use, which include: (a) hazard assessments; (b) vulnerability assessments; and (c) risk assessments that focus on potential climate impacts on subprojects.

23. **The project will adopt the same approach to support the active participation of women in agri-fishery enterprises that has been successfully implemented under the ongoing PRDP, to narrow the gender gap.** The PRDP aimed to raise women's participation in typical rural areas from around 25 percent to 45 percent. This has been exceeded, with women's participation now at 48 percent. Building on this, the PRDP Scale-Up will involve a different group of beneficiaries and enterprises, and aims to reach 50 percent participation for women. The PRDP Scale-Up will support enterprise subprojects to increase their members' access to resources, knowledge, and income-generation opportunities within the value chain. Funding support for subprojects will encompass inputs, equipment, capital requirements, and technical assistance for agricultural and fisheries production, processing, marketing and enterprise management. As detailed in the POM, priority will be given to subproject proposals promoting women's roles and their inclusion as beneficiaries. Additional scores will be given in the appraisal and approval processes for enterprise subprojects, based on levels of women participation. Additionally, in the provision of technical assistance and capacity building under the project, the special needs of women will be taken into account; e.g., through the scheduling of training activities to accommodate the multiple roles often required of women for childcare, household work etc. A PDO indicator under the PRDP Scale-Up will be the percentage of female farmers reached with agricultural assets or services, with a target of 50 percent. An intermediate results indicator under Component 3 will monitor the number of women directly participating in clustered enterprises, also with a target of 50 percent. Through the further mainstreaming of the MIS/M&E system developed under the PRDP, the project will strengthen the DA's capacity to effectively capture gender disaggregated information at an institutional level. This will provide the database through which the DA can undertake more effective tailoring of strategies and delivery of services, to support women's greater participation in developing the agri-fishery sector.

24. **Component 1. National and Local Level Planning Component (I-PLAN) (US$15 million, of which IBRD is US$12 million):** This will support the planning and refinement of strategies to guide and evaluate: (a) the effectiveness of investments under the project; and (b) their contribution to the agri-fishery sectoral transformation goals of the PDP (2023–2028) and NAFMIP (2021–2030). A key activity will be strengthening the PCIP planning process institutionalized under the ongoing PRDP, which is now mainstreamed within the DA as a primary DA-LGU investment planning and convergence mechanism. Improvements to the planning process include introducing a regional/spatial perspective, integrating climate resilience, and promoting private sector financing, consistent with the country's Food Security Development Framework (FSDF) and the DA's Devolution Transition Plan. The PRDP Scale-Up will expand its support to developing and formulating the VCAs and commodity investment plans for rice and corn, which were not covered under the PRDP. Component 1 is assigned to the GCRF's Pillar 4 by operationalizing the NAFMIP and strengthening the DA's policies and investments.

25. Subcomponent 1.1. Operationalization of the NAFMIP (US$11.5 million, of which IBRD is US$9.20 million): This subcomponent will finance technical assistance, studies, workshops and training to: (a) incorporate regional/spatial perspectives into planning, along with the generation of the Regional Agriculture and Fisheries Investment Portfolio (RAFIP); (b) further strengthen the planning process by assessing climate and natural hazard risk and vulnerabilities, using available information from different decision support tools made available through the Planner's Portal, such as Climate Resiliency Vulnerability Assessment (CRVA), Expanded Vulnerability and Suitability Analysis (eVSA, and the Fisheries Vulnerability Assessment Tool (FishVOOL)[8]; (c) strengthen the convergence with DA partners and engagement with the private sector by using the PCIP process to broaden the base for agri-fishery sector transformation, and to promote public-private partnerships (PPPs) to catalyze further investments; (d) strengthen operational guidelines to ensure LGU project management and implementation units are adequately and consistently staffed, trained, and resourced to implement the PRDP Scale-Up, in keeping with the Institutional Strengthening Action Plan (ISAP)[9]; (e) formulate VCAs for rice and corn in line with the national food security agenda and in collaboration with the DA's rice and corn banner programs; and (f) enhance digital platforms, particularly the existing Planner's Portal, to strengthen planning, decision-making and e-learning through improvements in climate information and data storage, maps for better visualization, and decision-support tools, e.g., eVSA, CRVA, and VCAs. This will include training on digital planning platforms that provide information on markets, innovation and industry bottlenecks and meet decision-makers' needs at various levels

26. Subcomponent 1.2. Support to NAFMIP Implementation (US$3.5 million, of which IBRD is US$2.8 million): This subcomponent will finance technical assistance, studies, training, and workshops to address identified gaps in the value chain. It will also finance the design of policies and investments supporting the consolidation, modernization, industrialization, and professionalization of the agri-fishery sectors. It will support research and technical assistance for activities such as: (a) developing policies and regulations for more efficient supply chains; (b) enabling more accessible financing across all value chain stakeholders; (c) supporting spatial planning to identify development needs based on growth potential, climate risks, and vulnerabilities[10]; (d) promoting improved inputs, climate-smart technologies and innovations; and (e) supporting training and mentoring of youths through a variety of existing programs to stimulate interests and help develop the next generation of business-oriented and technologically-focused producers. The subcomponent will also continue to support: (a) the leveraging of additional resources for PCIPs through stronger engagement with the private sector; (b) harmonizing strategies in resource allocation and delivery of support services among implementers; and (c) conducting annual meetings to seek feedback from the private sector and industry representatives on markets, innovations, and bottlenecks.

27. **Component 2. Rural Infrastructure and Market Linkage Component (I-BUILD) (US$644.63 million, of which IBRD is US$479.22 million):** This will finance the current and new types of public infrastructure subprojects covered under the PRDP. All provinces will be eligible for investment financing based on needs identified through the VCAs and prioritized through the PCIP process. It will support climate-resilient value chain infrastructure to strengthen food distribution systems to enhance access and facilitate more stable food supplies and other agri-fishery products to

[8] The eVSA and CRVA tools are used to assess the suitability and priority to be given to investments. The eVSA is a GIS-based tool accounts for the combined analysis of vulnerability and suitability, and socio-economic conditions of a particular area. The CRVA is used to plan and implement strategies to help agri-fishery communities manage climate risks. FishVool is a vulnerability assessment tool for identifying maritime areas that are highly vulnerable to climate change impacts.

[9] Note, this will be undertaken in conjunction with Component 4 activities and will align with DA's Devolution Transition Plan for implementing the Mandanas ruling.

[10] Potential vulnerabilities will include animal health and food safety risks, given the country's vulnerability to pandemic risks including transboundary animal diseases, food safety and AMR control.

markets. It will also support improved technology to reduce postharvest losses and costs associated with transport and handling. The component will also support the completion of the FMR network plan, which will build upon the lessons and experiences of the PRDP. It will provide a harmonized screening guide to rationalize FMR investments across programs and projects of government agencies and LGUs, based on access needs and climate vulnerability, among other things. The activities financed will entail cost-sharing between the DA and LGUs. This may change during project implementation as LGUs are allocated more resources through the Mandanas ruling. The component facilitates convergence with other government programs and linkages with commercial banks.Component 2 is assigned to GCRF Pillar 1, providing value chain infrastructure support to strengthen the food supply chain, improving food security.

28. Subcomponent 2.1. Value Chain Infrastructure Support (US$623.29 million, of which IBRD is US$462.15 million): This will finance the design and construction of rural infrastructure. While most funding is expected to be for FMRs, given the strong demand from LGUs, eligible subprojects will also include potable water systems (levels 1 and 2), climate-responsive irrigation facilities (e.g., sprinkler, drip, solar-powered, ram pump, and spring development), as well as public LGU-operated pre-and postharvest facilities, e.g., tramlines, modern abattoirs, dressing plants, fish landings and watch towers). Table 2 provides an indicative listing of subprojects to be supported under the PRDP Scale-Up, based on the portfolio of proposals already available. The selection criteria and procedures for preparing, reviewing, approving, and financing infrastructure subprojects will be further improved, building on those defined in the well-established PRDP POM, which already incorporates climate resilience and road safety measures. Further enhancements in the POM will include using provincial/municipal (climate and natural) hazard maps and information from the GeoRiskPH data platform (*https://www.georisk.gov.ph*), which hosts multi-hazard maps from different government agencies. These will be used to evaluate the risk profile of proposed subprojects to better inform the engineering design and implementation requirements. Additional technical support will be mobilized to ensure that the necessary climate resilience and road safety measures are properly incorporated in subproject requirements/documents and implemented. Whenever possible, the Green Building Code (Presidential Decree No. 1096, 2015) will be incorporated into the design and construction of vertical structures to lessen the subproject's environmental effects through improved energy efficiency, water and wastewater management, materials sustainability, solid waste management, site sustainability, and indoor environmental quality. Additionally, and in accordance with the agreed ISAP to be managed under Component 4, procedures will be strengthened to ensure full understanding and compliance with the World Bank's fraud and corruption guidelines, including compliance with the procurement and financial management risk mitigation measures and that procedures for elevating and resolving exceptions are being followed. The institutional strengthening implementation will enhance construction management and supervision of subprojects to ascertain compliance with their design and technical specifications.

**Table 1. Indicative Listing of Infrastructure Subprojects under Subcomponent 2.1**

| Subproject Type | Quantity* | Indicative Cost (in US$ million) |
|---|---|---|
| Farm-to-Market Roads | 1,174 | 463.8 |
| Bridges | 1,962 | 41.6 |
| Irrigation Facilities | 2,517 | 14.6 |
| Potable Water Systems | 64,512 | 44.7 |
| Value Chain Rural Infrastructures | 62 | 58.6 |

* Subprojects in the pipeline and are under review.

29. Subcomponent 2.2. Approaches for Improving the Effectiveness and Sustainability of Infrastructure Investments (US$21.34 million, of which IBRD is US$17.07 million): This will support technical assistance, studies and capacity building for updating the specifications and use of provincial and municipal climate and natural hazard maps. Doing so will ensure infrastructure design and implementation requirements address regional variabilities and differential exposure to climate risk, impact, and vulnerabilities. The climate adaptation measures to be introduced are expected to generate significant climate co-benefits through: (a) mainstreaming climate resilience throughout the lifecycle of subproject asset management; (b) providing technical support for LGUs to enhance their design, implementation, and O&M requirements and capacity; (c) using science-based instruments, e.g., GIS-based tools, including the georisk.gov.ph platform, to better identify climate risks and vulnerability of subprojects; (d) adopting more climate-resilient design standards permitting all-weather access, while also accounting for increased frequency of extreme weather events; (e) strengthening climate-resilient road safety measures; and (f) completing the Farm-to-Market Road Network Plan to enable mainstreaming of a harmonized screening guide, which will rationalize FMR investments based on access needs and climate vulnerability, across government agencies. As already implemented under the current PRDP, women will be encouraged to participate in community-based routine maintenance of this community infrastructure, creating employment opportunities and building their skills.

30. **Component 3. Enterprise Development Component (I-REAP) (US$111.37 million, of which the IBRD is US$70.86 million):** This will support Implementing Proponents, defined as legally established and registered FCAs, FCA clusters (composed of two or more FCAs which have bonded together to implement a the proposed enterprise), or LGUs, which are selected according to the eligibility criteria as per the POM. Enterprise subgrants will finance common service facilities, such as warehouses and drying and cold storage facilities. Such facilities will be designed to raise the profitability of agri-fishery producers by enabling economies of scale in product consolidation, handling, logistics and marketing. The component will also provide technical support for enterprises to improve product quality, reduce postharvest losses, and strengthen market bargaining power and linkages with larger institutional buyers. The PCIP process will be used to identify the key products and investments, and will be done together with prioritizing the complementary service delivery mechanism and infrastructure that supports the value chain. These initiatives will be financed under Component 2[11]. More specifically, the component will finance: (a) subgrants for common service facility investments identified through the enterprise business plans; (b) technical support for providing climate-smart technologies for better agri-fishery systems; (c) facilitating access to development financing through project-supported linkages with commercial banks; (d) facilitating access to insurance and business management support; and (e) facilitating linkages with institutional buyers for accessing more profitable markets and services. Component 3 is assigned for the GCRF's Pillar 1 by expanding rural agri-fishery enterprise cluster productivity, designed to enhance food security and supply, especially to metropolitan areas.

31. **Support for Implementing Proponents will follow the same cost-sharing arrangements used under the ongoing PRDP.** For LGU-initiated subprojects, the cost-sharing scheme will be 60 percent of IBRD loan proceeds, 20 percent from the GoP, and 20 percent in LGU equity across all LGU income classes. For FCA-initiated subprojects, the cost-sharing will be 60 percent loan proceeds, 20 percent counterpart funding (GoP), and 20 percent FCA or FCA cluster equity, in cash or in kind. For FCA subprojects, the cost-sharing arrangements will be irrespective of the scale of the enterprise. Overall management of this component will be enhanced through the Enterprise Operation Monitoring

[11] The PRDP Scale-Up is expected to catalyze private and public investments in the agri-livestock sector for addressing animal health, food safety, and anti-microbial resistance risks. As such, it will complement the grant support being developed through the pandemic fund investments in animal production, animal health services delivery, value chain infrastructure, and promotion of good agriculture practices, animal husbandry practices, and manufacturing practices, hazard analysis and critical control points (HACCP) in processing enterprises and upgrading the agriculture and fresh produce markets.

System (EOMS) developed under PRDP to track the progress of enterprise operations and their achievements based on the approved business plans.

32. **The project will support those clusters of FCAs, which have already been clustered by ongoing DA initiatives, particularly the F2C2 program and PAFES.** The PAFES is an initiative designed to develop the approach and methodology for capacitating LGUs to provide technical services in keeping with the additional resources LGUs can expect through the Mandanas ruling. This initial clustering process is a regular DA function underpinned by DA Memorandum Circular 21 (series of 2022) which requires all DA bureaus and agencies to focus their technical support at the cluster level. The project will build on this process by working only with FCA clusters that have already been formulated.

33. Subcomponent 3.1. Rural Agri-fishery Enterprise Cluster Productivity Enhancement and Increased Access to Markets (US$91.2 million, of which IBRD is US$54.72 million): The subcomponent will fund Implementing Proponents' proposals for civil works, equipment, and machinery for small to large-scale climate-resilient pre- and postharvest, processing, logistics, and distribution facilities. It will include technical assistance to enhance the efficiency of FCA, FCA clusters and LGU enterprises to improve product quality and safety, logistics, and profitability. Implementing Proponent enterprise proposals could come from either LGUs or FCAs/FCA clisters. Proposals from LGUs have to demonstrate that there is a critical value chain-based need, and that private sector investment for the required facility is not forthcoming. In such cases, the LGU must identify a partner FCA, FCA cluster, or a private business entity that will manage or co-manage the enterprises' operations. Proposals from an FCA or an FCA cluster have to indicate a lead FCA which will be responsible for the subproject proposal formulation, implementation and operation. While an FCA cluster proposal may involve a partnership with a private agribusiness entity (which may initiate the enterprise proposal), the Implementing Proponent must be either an FCA, FCA cluster, or an LGU. The arrangements for each of these modalities are specified in the POM, together with the eligibility criteria and business plan requirements on which investment decisions will be based. These criteria will include agreements between the various parties that, among other things, will encompass marketing agreements, arrangements for technology transfer, supplier credit or provision of other types of services, along with safeguard requirements and financial viability. Additionally, and in accordance with the institutional strengthening under Component 4, procedures in the POM are designed to ensure all recipients fully understand the requirements of the World Bank's fraud and corruption guidelines (World Bank 2016).

34. Subcomponent 3.2. Increased Competitivenss of Agri-fishery Enterprise Clusters (US$20.17 million, of which the IBRD is US$16.14 million): This will fund technical assistance, studies, training, and workshops, providing a wide range of services tailored to meet enterprise business plan requirements. These include: (a) improved technical and management performance; (b) access to innovative technologies; (c) market diversification; (d) promotion of products through trade fairs and online platforms, e.g., the PRDP Online Marketplace; and (e) access to finance and insurance. Technical services will be provided through program contracts with the best-equipped local agencies. For producer clusters entering into formalized marketing agreements with enterprises, technical assistance will be based on the Implementing Proponent cluster development plans (DA-Memorandum Circular 21, series of 2022). Such services will particularly focus on climate-smart approaches for improving produce quality at the farm gate. The services will encompass modern on-farm cultivation, handling, storage, crating, grading and food safety technologies, and facilitated access to financing and insurance. Other activities to be supported under this component include: (a) support for implementing PAFES by training LGUs in market development and clustering; (b) collaboration across DA agencies in promoting youth engagement in agriculture and agribusiness in support of Component 1; and (c) strengthened partnerships with the private sector.

35. **Component 4. Project Implementation Support Component (I-SUPPORT) (US$47.40 million, of which IBRD is US$38 million):** This will finance project management, technical assistance, studies, training and capacity building for project staff during the project period. It will support all project oversight, management, fiduciary, M&E, and knowledge management aspects. These include the execution of an ISAP. Organizational arrangements and implementation procedures will be integrated into the ongoing Second Additional Financing to PRDP (PRDP-AF2), scheduled to close on July 31, 2025. Several units will implement the various functions: administration, finance, legal, economics, social and environmental safeguards, monitoring, evaluation and learning (MEL), InfoAce, governance and geotagging, and budget and accounting. The continuity of staff, functions and implementation procedures provide a solid basis for the nationwide and transformational scope of the PRDP Scale-Up. Staffing requirements will be augmented as needed by hiring and engaging permanent DA personnel.Component 4 is assigned to GCRF Pillar 1.

36. **This component will finance technical assistance, studies, training and workshops.** These include: (a) further digitalization of project management processes and the monitoring and supervision of investments; (b) mainstreaming of the requirements for environmental and social impact management and risk mitigation; (c) fiduciary management and oversight with particular reference to the ISAP (Annex 1); (d) further development of document processing/monitoring innovations; (e) mainstreaming development of a knowledge management portal to strengthen opportunities for learning and exchange of evidence-based experiences, good practices and MEL results; and (f) enhanced information advocacy, communication, and education; and (g) mid-term and end-project evaluations.

37. **Component 5. Contingent Emergency Response Component (CERC) (zero allocation)**: This component will allow for rapid reallocation of uncommitted project funds towards urgent needs in the event of a geophysical, climate-related, or man-made disaster or public health emergency. The level of evidence required to activate this component is flexible: it includes the declaration of a State of Calamity by the mandated national or subnational authority or a State of Public Health Emergency. The agreed trigger will enable the reallocation of uncommitted project funds to support immediate response and recovery needs from other project components. Disbursements would be made against a positive list of critical goods and civil works required to support the immediate response and recovery needs. The potential CERC-financed activities will: (a) align with the main project activities; (b) follow the project's implementation arrangements; and (c) be based on DA's mandate under the various emergency response and contingency plans. The POM will include detailed descriptions and procedures.

**Project Costs**

38. **The overall cost of the proposed project is estimated at US$818.40 million to be implemented over six years.** The cost comprises an IBRD loan of US$600 million, the government counterpart contribution of US$216.17 million: US$101.35 million from the DA and US$117.05 million from LGUs/FCAs. The FCA mobilization of private capital is estimated at US$2.23 million, as summarized in Table 2.

**Table 2. Project Costs and Financing, in US$ Millions**

| Component | IBRD Loan | GoP Counterpart | | Total | Share to Total Cost (%) |
|---|---|---|---|---|---|
| | | DA | LGU/FCA | | |
| **Component 1: I-PLAN** | 12.00 | 3.00 | - | 15.00 | 2% |
| **Component 2: I-BUILD** | 479.22 | 66.60 | 98.81 | 644.63 | 79% |
| **Component 3: I-REAP** | 70.86 | 22.27 | 18.24 | 111.37 | 14% |
| **Component 4: I-SUPPORT** | 37.92 | 9.48 | - | 47.40 | 6% |
| **TOTAL** | 600.00 | 101.35 | 117.05 | 818.40 | 100% |
| **Share to Total Cost (%)** | 73% | 12% | 14% | 100% | 100% |

### C. Project Beneficiaries

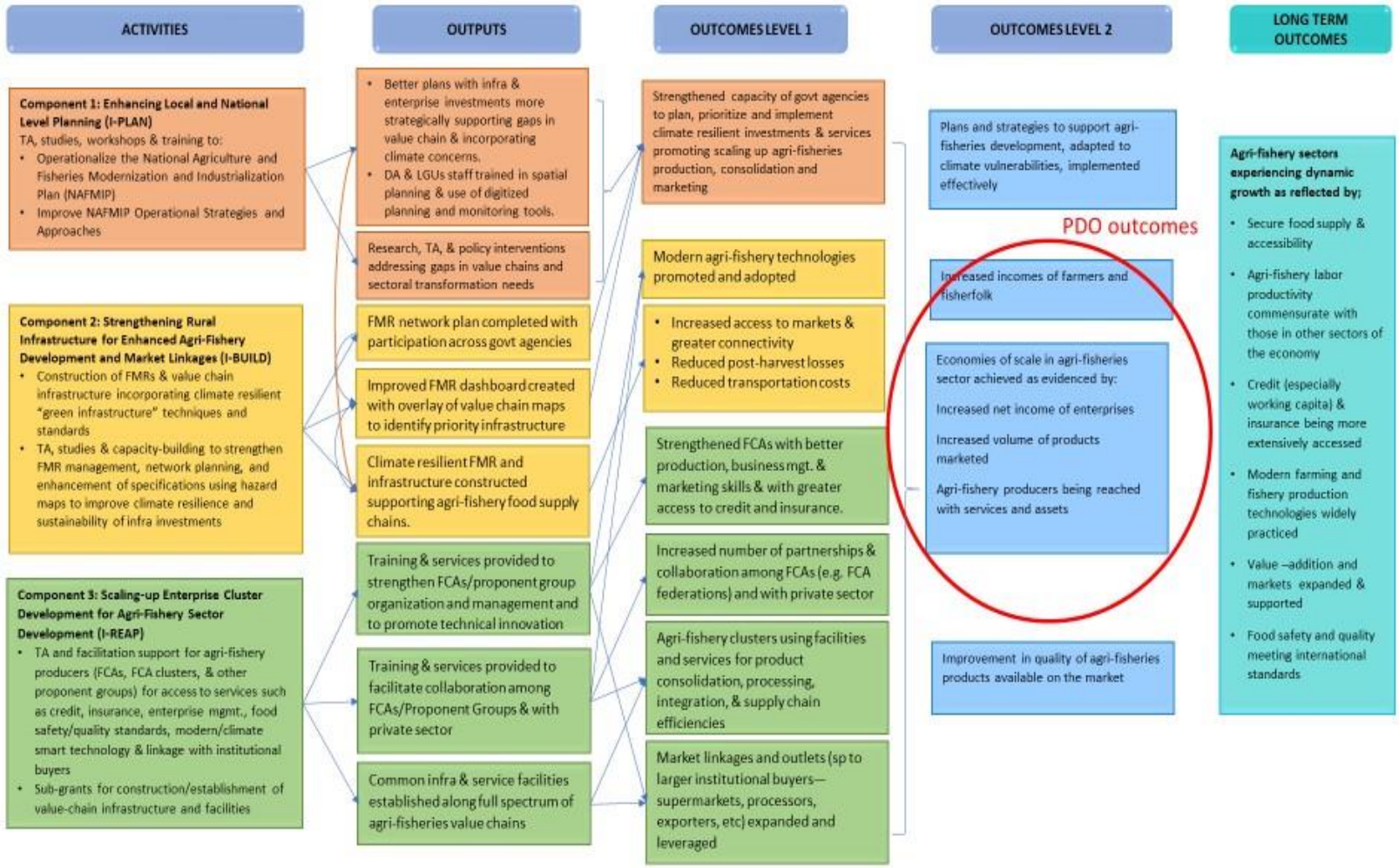
39. **The direct project beneficiaries comprise: (a) FCAs and other enterprises[12] engaged through joint ventures in providing common service facilities; and (b) the agri-fishery producers linked through market agreements with such service facilities**. The project will directly benefit 450,000 farmers and fisherfolk through agri-fishery services and assets, of whom 50 percent will be women. Benefits will come through the technical assistance, infrastructure and enterprise subproject interventions the project supports. This will be reflected in higher profitability resulting from clustering/economies of scale, more efficient (lower cost) production, improved product quality (price and shelf-life), better market access (bulk sales/stable market outlets), and enhanced supply chain linkages (lower cost and reduced postharvest losses). Indirect beneficiaries will include: (a) consumers accessing better quality and regular supplies of agri-fishery food products; (b) a wide range of the rural population engaged in commerce who will benefit from the increased economic activity generated through scaling-up common service facilities; (c) other producers through the expansion of commerce and services; and (d) those employed during the construction of all-weather road access.

### D. Results Chain

40. **The pathways through which the planned investments will contribute to the desired outcomes are illustrated in the Theory of Change (TOC) (Figure 1).** The project will expand upon the achievement of the ongoing PRDP (see Box 1). It will continue to provide leadership in driving the changes needed to transform the Philippine agri-fishery sectors from small-scale, low-technology systems with supply chains dependent on small-scale traders and intermediaries to a more dynamic, private sector-led and technology-based system. Activities and investments under the project will address fundamental constraints in the agri-fishery sectors. These include limited access to agriculture services and improved technologies; inadequate rural road connectivity; inefficient systems in logistics, consolidation, pre- and postharvest handling, storage and marketing; limited accessibility of investment and working capital; inadequate product insurance coverage; and frequent extreme weather and climate change. The transformation process will take time. As noted in the TOC, the transformation will require considerable technical input for clustering farmers and farm-gate product improvement, business management support for enterprises, and sustained government support for an incentive framework able to attract private sector investment.

[12] Enterprises may include clusters of FCAs, producer associations, federations, processors, consolidators, food manufacturers etc., across all segments of the value chain.

*Figure 1. Theory of Change*



### E. Rationale for Bank Involvement and Role of Partners

41. **There is an immediate need for public financing for improving food value chain efficiency, to alleviate the rising cost of food.** Several factors have increased food prices: (a) disruptions due to Russia's invasion of Ukraine, which pushed global commodity prices to record levels and raised the price of food imports and agricultural inputs; (b) weather-related production losses; (c) flare-ups of African swine fever and the higher cost of animal feeds; (d) currency depreciation and import delays; and (e) inadequate transport and logistics, especially the coverage and condition of FMRs which restrict the expansion of agricultural value chains and create a considerable supply-side inefficiencies. These factors have reduced the incomes of farmers, fisherfolk, and others employed across all value chain segments. Public financing is also critical for leveraging the transformative changes and private sector investment needed in the agri-fishery sectors, a key priority of NAFMIP (2021–2030). Public sector investments under the project include producer clustering, establishing enterprises providing common service facilities, and enhancing services and access to credit and insurance. These investments are all designed to incentivize further private-sector investment and technological innovation.

42. **The Bank's long history of support for rural development in the Philippines and globally provides a wealth of experience to support the PRDP Scale-Up.** IBRD lending for agriculture and rural development in the Philippines has amounted to over US$1 billion and spans 23 years. This lending began in 2000 with the Mindanao Rural Development Projects (MRDP I and II), and since 2014, has been followed by the ongoing PRDP. The Bank's value- added also builds on a considerable platform of analytical work on Philippine agri-fishery sectoral transformation policies and options. This long-term operational and analytical partnership with the DA is particularly relevant as the government seeks to bring about substantial transformative reforms in accordance with the NAFMIP (2021–2030).

43. **The planned project activities share a common theme of bilateral and multilateral support from development partners over many years, although on a smaller, provincial or regional scale.** In particular, there is potential for developing complementarities and partnerships with ongoing activities, including: (a) the Rural Agro-enterprise Partnerships for Inclusive Development and Growth Project (RAPID), financed by the International Fund for Agricultural Development (IFAD) and implemented by the Department of Trade and Industry (DTI); (b) the Development Partnership Project (AGRI-DPP) financed by the German Agency for International Cooperation (GIZ) and supporting partnerships with leading firms in export value chains; (c) Advancing Philippine Competitiveness (COMPETE), a project funded by United States Agency for International Development (USAID) that promote PPPs and improved credit access in the agriculture sector; and (d) the Philippines Partnership for Sustainable Agriculture, a multi-stakeholder partnership platform initiated by Grow Asia and the DA.

### F. Lessons Learned and Reflected in the Project Design

44. **The project design builds on several World Bank-supported projects, sectoral studies (e.g., World Bank 2020, 2021a, 2021b), and a range of activities initiated by the DA aiming to modernize the agri-fishery sectors.** The project design has benefited extensively from 23 years of experience implementing the earlier Mindanao Rural Development Projects (MRDP 1 and 2), the ongoing PRDP[13], and through support to Agrarian Reform Communities Development Projects (ARCDP 1 and 2). Annex 2 provides a comprehensive listing of lessons. Key among these are the following:
    a. PCIPs are an effective tool for improving agri-fishery sector investment planning and leveraging resources;
    b. Clusters enable consolidation of production, better marketing opportunities, and the sharing of resources

[13] PRDP: Interim Implementation Completion Report (ICRR0022589).

and technologies;

c. Clustering requires strong collaboration, highlighting the need for careful selection of Implementing Proponents and for sustained technical support for business management;
d. Partnerships between clusters and institutional buyers work best where the lead Implementing Proponent provides strong direction and technical support to producers;
e. Allowances need to be made for cluster members to sell a portion of their produce to the buyers of their choice outside of the partnership to allow fast cash access and avoid members side-selling;
f. Sustained technical support is essential at the farm level to improve product quality;
g. Consolidation of produce leads to more stable markets and access to larger/institutional buyers;
h. Opportunities exist for wider use of digital platforms linked with industry to improve market linkages and information on products and service availability.

## III. IMPLEMENTATION ARRANGEMENTS

### A. Institution and Implementation Arrangements

45. **The project will be national and run under the direction of the DA Secretary through the Office of the DA Undersecretary for Operations.** The institutional arrangements will be the same as for the ongoing PRDP project. Under the direction of the Assistant Secretary for Operations, the PRDP National Project Cooridnation Office (NPCO) will provide overall management of the PRDP Scale-Up project. The existing National Project Advisory Board (NPAB) for PRDP will be replaced by a National Project Steering Committee (NPSC) to be established no later than three months after the effective date. The NPSC will have the same functions as NPAB but will also provide oversight for other World Bank-supported DA projects to facilitate their mainstreaming of policies and core processes (see Annex 1).

46. **The project will be implemented at the regional level through the DA's Regional Field Offices (RFOs), which report to the Undersecretary for Field Operations and through that office to the Secretary of Agriculture.** For implementing PRDP and the follow-on PRDP Scale-Up, RFOs have been clustered into four groups based on geographical location: North Luzon, South Luzon, Visayas, and Mindanao (see Annex 1 for the regional composition of these clusters). The RFO of the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM) is represented by the BARMM's Ministry of Agriculture, Fisheries and Agrarian Reform (MAFAR). Each RFO grouping is supported by a Project Support Office (PSO) that provides administrative, legal and technical support for Regional Project Coordination Offices (RPCOs) established in each RFO. The RPCOs will manage the day-to-day implementation of PRDP and PRDP Scale-Up activities. The BARMM's RPCO is under MAFAR.

47. **Existing Regional Project Advisory Boards (RPABs) comprising local multi-agency, farmer, and other stakeholder representatives will also cover the PRDP Scale-Up.** RPABs, chaired by DA Regional Executive Directors or the MAFAR Minister in the case of BARMM, are responsible for approving subproject proposals and harmonizing the approach and inter-institutional linkages. RPCOs provide the secretariat functions for the RPABs.

48. **At the LGU level, partnership arrangements between the DA and provincial, municipal and city LGUs will be established through Memoranda of Agreement (MOAs) that define responsibilities for implementing PRDP Scale-Up.** The municipal and city LGUs can enter into a MOA with DA, independent of the provincial LGUs. The MOA will be entered between the DA and participating LGUs before any investment in that LGU. The MOA will require each

LGU to establish a Project Management Implementation Unit (PMIU) with staff, resources and responsibilities for implementing subprojects at the provincial, city, and municipal level (PPMIU, CPMIU, and MPMIU, respectively). The MOA will also include provisions supporting the project's institutional strengthening action plan or ISAP (Annex 1, Table A1.1). Implementation management agreements (IMAs) for infrastructure subprojects will also be entered into for infrastructure subprojects between the DA and the Implementing Proponent. An IMA will be executed between the DA and LGU in cases where the LGUs will be the Implementing Proponent. Where the Implementing Proponent is an FCA or clustered FCA, a tri-partite IMA will also be entered into between the DA, LGU, and FCA.

49. **The PCIPs, now institutionalized through PRDP, will be further utilized and strengthened as the collaborative planning instrument between the DA and the LGUs.** The PCIPs provide an effective platform through which the DA rationalizes its localized support for productivity strengthening. The suitability of the areas for commodities is determined through the eVSA tool, which considers environmental, edaphic, and socio-economic factors. The type of interventions supported is subsequently determined through VCAs.

50. **The comprehensive POM utilized for the PRDP will be refined to include additional detail needed for implementing the PRDP Scale-Up.** In particular, this will include revised environmental screening, construction and safety standards for infrastructure, and enterprise-supported investments. The POM details the technical and procedural process for selection, design, implementation, procurement, safeguards, O&M, and M&E of subproject investments for both infrastructure and enterprise development. These manuals are available publicly on the web (*da.gov.ph)* and are subject to periodic review and updating to accommodate the evolving opportunities and needs of the project.

51. **Social and Environmental Safeguards (SES) units have been established at the NPCO, PSO and RPCO levels of project organization within the DA. All participating LGUs have designated safeguard focal persons in their PMIU.** These arrangements will continue to support the PRDP Scale-Up. Given the number and scale of subprojects to be supported, additional staff will be hired. Through the PRDP, several innovations and refinements in procedures, protocols, forms and templates have been institutionalized, and safeguards capacity has been strengthened through training, workshops and learning-by-doing facilitated by joint NPCO-PSO-RPCO reviews. As the Environmental and Social Framework (ESF) is applied, additional training and capacity building will be rolled out. The project will partner with the Philippine Center for Environment and Social Sustainability for ESF capacity building and mainstreaming activities.

52. **BARMM will have similar requirements, procedures, and approaches for safeguards and PCIP preparation review, approval, and subproject monitoring.** The PRDP Scale-Up will adopt the same measures summarized in Annex 1 and detailed in the POM. By design, the project will exclude any areas in an active conflict situation. Subprojects affecting minority groups, including Indigenous Peoples, will require their representatives to be present in consultations and that local labor is hired to implement them. In the first instance, safety concerns are the LGU's responsibility, which will be reflected in the MOAs to be entered into between the DA and LGUs governing all activities and investments under the project. Such fragility and related implementation procedures are central to the World Bank-supported MIADP (see Annex 1).

### B. Results Monitoring and Evaluation Arrangements

53. **The results framework describes the PDO-level outcome indicators, component-specific intermediate results indicators, and their respective baselines and targets**. Results-based M&E arrangements and responsibilities will be similar to and integrated with those institutionalized under the PRDP. The PRDP M&E system has proven to be an

effective mechanism for decision-making and for strengthening and mainstreaming operational guidelines. Information derived from the MIS/M&E system will be consolidated into semi-annual and annual progress reports. These will be complemented by baseline, mid-term and completion surveys and analyses, and through other online and digital tools developed through the PRDP. These include: (a) rapid appraisals of emerging benefits (RAEBs), an instrument for obtaining real-time feedback on benefits of subproject investments upon their completion; (b) a web-based grievance redress mechanism (GRM); (c) an operation and finance information system; and (d) geotagging and use of drones for subproject monitoring.

### C. Sustainability

54. **This national project is designed to help bring about sustainable food security, increased agri-fishery profitability across all value chain segments, resilience to climate change, and peace and security in rural areas.** As such, sustainability is a priority. SKey project design features to support these objectives include:
    a. Mainstreaming and converging institutional arrangements and instruments for fostering private sector-led, competitive and market-oriented approaches to sector development across government agencies and LGUs;
    b. Enhancing knowledge management through studies, technology promotion, best-practice development and showcasing to foster transformative changes and an enabling policy environment;
    c. Promoting improved cultivation, harvesting, handling and storage techniques that will mitigate climate and environmental issues through techniques to minimize water requirements and heat stress, more effectively manage nutrient and chemical use and run-off, and improve product quality and reduce postharvest losses;
    d. Institutionalizing climate risk screening facilitated through geospatial analysis, including the use of provincial/municipal hazard maps and information from the GeoRiskPH data platform (*https://www.georisk.gov.ph*), which hosts multi-hazard maps from different government agencies for analyzing exposure to flooding, cyclones, water scarcity etc., to enhance the quality and sustainability of subprojects;
    e. Adopting enhanced climate-resilient infrastructure standards of the DPWH, National Irrigation Administration, Philippine National Standards, Bureau of Agriculture and Fisheries Standards, Philippine Agricultural and Biosystems Engineering Standards, National Building Code of the Philippines, and National Meat Inspection Code;
    f. Adhering to the Green Building Code (DPWH 2015) to lessen environmental effects.

## IV. PROJECT APPRAISAL SUMMARY

### A. Technical, Economic and Financial Analysis

55. **Technical Analysis:** Considerable technical experience exists for the infrastructure and enterprise investments under the project, based on 20 years of experience implementing MRDP 1 and 2, and the ongoing PRDP. Technical design features will include climate risk screening, using provincial/municipal hazard maps, adopting enhanced climate-resilient infrastructure standards, and adhering to the Green Building Code. Doing so will lessen environmental impacts through improved energy efficiency, water, and wastewater management, material sustainability, solid waste management, site sustainability, and indoor environmental quality. Other technical design features have been informed by case studies and best practices drawn from projects implemented across the Philippines and internationally (Annex 2).

56. **The Economic and Financial Analysis (EFA) was carried out on key representative commodities and subprojects, considering enterprises of various sizes.** These included rice and corn (focus on integration and clustering), livestock (swine, chicken), fisheries (milkfish, seaweed), highland vegetables, onion, coconut, banana, cacao, and coffee. The modeled subprojects include: (a) small, medium and large enterprises designed to consolidate and improve the quality and profitability of agri-fishery producers; (b) rehabilitation/construction of rural roads, bridges and tramlines linking key production areas with the national road network and enabling access to markets; (c) construction of small-scale irrigation systems to improve agricultural productivity and resilience through better water management and water availability; (d) installation of potable water supply systems that promote better health; and (e) construction of value chain support infrastructure such as slaughterhouses, fish landings, and feeder ports to increase the market value of agricultural products and improve food distribution systems.

57. **Findings from the EFA show the PRDP Scale-Up will increase capacities and opportunities for farmer and fisherfolk cooperatives and associations to engage in value chain activities.** This will empower the sector to achieve agri-food system resiliency through: (a) an enterprise development component focused on big-ticket subproject interventions that provide common service facilities and support for agri-fishery producer clustering, modernized agriculture production at scale, and product consolidation/integration; and (b) an infrastructure development component strengthening logistical support and connectivity of food supply chains, and providing improved technology to reduce postharvest losses and costs associated with transport and handling. The project is expected to expand its impacts and benefits by operationalizing an improved strategic planning framework emphasizing support for multi-commodity interventions with a regional agriculture development perspective. Annex 3 details the EFA methodology.

58. **The results of the EFA confirm that the sector will benefit financially and economically from the project's interventions.** The base scenario's internal rate of return (IRR) for the project is 29.41 percent, with a net present value (NPV) of US$1,031 billion and a benefit-cost ratio (BCR) of 1.74 (Annex 3). The main benefits arise through higher incomes, the improved value of marketable outputs, strengthened food distribution systems, and reduced postharvest losses and transportation costs. Over the medium to long term, the prospective agri-fisheries interventions will transform the sector to realize economies of scale.

59. **The economic analysis incorporates the impact of GHG emissions using a low and a high shadow price of carbon, following the World Bank's 2017 guidelines.** With the infrastructure and enterprise interventions of the project, the total net carbon balance will be average +25,727 $tCO_2eq$ emissions per year, corresponding to an estimated total of +514,543 $tCO_2eq$ emitted over the entire project life. Estimates for low and high carbon price equal to US$44 and US$87, respectively, show the project remains feasible. The analysis yields a 29.19 percent economic internal rate of return (EIRR), a US$1.020 billion NPV, and a 1.73 BCR for the low estimate, and a 28.98 percent EIRR, a US$1.009 billion NPV, and a 1.72 BCR for the high estimate.

### B. Fiduciary

60. **Institutional Strengthening Action Plan (ISAP): Through the ongoing PRDP, various procedures have been implemented, backed by digital tools and systems, to address fraud and corruption risks and enhance investment quality and service delivery.** Given the added scope and scale of interventions under the PRDP Scale-Up, including activities partially supported by the GoP and participating LGUs, potential risk areas of the systems and procedures were discussed during project preparation (see Annex 1).

61. **The DA's financial management systems have been assessed and found to meet the Bank's requirements.** There is also a sufficient basis for relying on the country systems for all financial management aspects of the project. The overall financial management responsibility will be at the NPCO level and be supported by the DA's FM Unit at the DA Central Office. At the PSO and RPCO levels, these will also be supported by the DA's financial management units in the respective regions. As the PRDP Scale-Up will be implemented in parallel by many of the same DA units and LGUs responsible for implementing MIADP, FishCore, and PRDP, the implementation arrangements and support plan (Annex 1) provides for a particular focus on financial management, given the scale of operations being implemented by the DA. The PRDP Scale-Up also allows the hiring of additional staff as needed. In line with the government system, the key FM roles, including the budget officer, accounting staff, and treasurer, will be mainstreamed with the region hosting the PSO. In addition, an FM staff member will be hired or seconded to support the PSO in submitting quarterly unaudited interim financial reports (IFRs) and preparing annual financial reports. The audit report should be made available to the World Bank no later than six months after the end of each fiscal year. The project will follow the internal controls and policies found in the National Government Accounting System (NGAS), Government Audit and Accounting Manual, Commission on Audit (COA), Department of Budget and Management memoranda and circulars, and other laws and regulations. At all levels, the respective DA FM staff will review supporting documents for project disbursements. Based on the FM assessment conducted and with the implementation of the mitigation measures, the FM arrangements will satisfy the World Bank's minimum requirements under the World Bank policies. The FM risk and the corresponding risk mitigation measures are discussed in the risk section.

62. **The World Bank procurement framework will be used.** All procurement of goods, works, non-consulting services and consulting services under the project financed by the loan will be carried out under the World Bank's Procurement Regulations for IPF Borrowers (November 2020) and the provisions of the loan agreement and procurement plan (PP). The project will be subject to the World Bank's anti-corruption guidelines (October 15, 2006, revised in January 2011, and as of July 1, 2016). The project will use the Systematic Tracking of Exchanges in Procurement (STEP) procedure to plan, record, and track procurement transactions.

63. **The DA has developed a Project Procurement Strategy for Development (PPSD) to address how the procurement activities will help achieve the project development objectives and deliver the best value for money under a risk-based approach.** The PPSD will inform the most appropriate method and approach to be used for each of the procurement activities. It shall provide adequate justification for the PP selection methods. Based on the PPSD findings, the DA has drafted a PP for the first 18 months of project implementation. It will be updated and subject to the Bank's prior annual approval, or as required during project implementation to reflect any substantial changes in procurement methods.

64. **All contracts for goods, works, and services to be procured in line with the national market approach shall follow the Philippines' National Procurement Procedures set out in the Philippines' Government Procurement Reform Act (Republic Act 9184).** This was assessed and found to be broadly consistent with the requirement of the World Bank procurement regulations, Section V – Paragraph 5.4, National Procurement Procedures, subject to a few conditions specified in the PPSD and in the project text section of the PP that has been approved at negotiations, and reflected in the bidding documents, as applicable.

65. **The main procurement entities under the project will be the LGUs and FCAs, with the NPCO and RFOs also undertaking minor procurement of mostly technical assistance and goods**. The procurement capacity assessment by the World Bank and DA's PPSD is completd. The documents confirmed the key risks that may impact procurement under the project along with the recommended mitigation measures listed under the fiduciary risk section. As the

PRDP Scale-Up will be implemented in parallel by many of the same DA units and LGUs responsible for implementing MIADP, FishCore, and PRDP, the Implementation Arrangements and Support Plan (Annex 1) focuses on procurement, given the scale of operation being implemented by the DA.

66. **Citizen Engagement. Engagement with project beneficiaries and the broader community will be actively pursued and encouraged throughout project implementation.** This will build on the comprehensive citizen engagement procedures established under the ongoing PRDP. As described in the POM, such procedures allow stakeholders to give feedback, advice, opinions, or recommendations for ongoing or proposed issues or subprojects, to ensure transparency and accountability. This will be monitored through the results-based M&E system, which uses real-time information gathered through geotagging, consultation, and feedback. The POM supports gathering information online, through confidential reporting, written responses or reply slips, face-to-face focus group discussions, or via video conferences. These procedures, which are detailed in the POM for each project component, are in addition to the GRM established under PRDP, which is now being mainstreamed in the DA. The GRM process includes an online reporting system and a written complaint form system addressed to the grievance point person or committee of the relevant project implementation body, i.e., an NPCO, PSO, RPCO, or LGU. An intermediate indicator has been included in the Results Framework. Grievances will be registered, and the responses' status will be reported semi-annually.

### C. Legal Operational Policies

| | Triggered? |
|---|---|
| Projects on International Waterways OP 7.50 | No |
| Projects in Disputed Areas OP 7.60 | No |

### D. Environmental and Social Safeguards

67. **The project will focus on various interventions involving civil works and facilities that support agri-fishery production, processing, storage, marketing and enterprise-related activities.** The project activities are expected to generate environmental and social risks and impacts that will be identified and addressed through subproject selection, design and implementation processes. The PRDP Scale-Up is national and covers many landscapes: lowland plains, mountainous rolling terrain, riverine systems, fluvial waterways, and long, rugged coastlines. Project locations will be various types of agricultural lands and coastal areas, many of which are located in low-income rural areas, which are at various stages of development, managed by Implementing Proponents with different capacities.

68. **The project will build on the substantial experience and capacity developed through implementing the World Bank safeguard policies under the ongoing PRDP and the earlier MRDP 1 and 2 (2000–2014).** A capable SES management system has been established to comply with the requirements for environmental assessment, M&E and reporting encompassing Indigenous Peoples, land acquisition, donation, grievance redress, labor influx, and conflict sensitivity and assessment. The DA-SES team oversees the implementation of the Integrated Environmental and Social Safeguards Framework (ESMF), which includes a resettlement policy framework and an Indigenous Peoples Framework. The mainstreamed processes in this system include various steps: environmental and social screening, conducting regular consultations, preparing and implementing frameworks and plans for environmental and social management, disclosing documents, and establishing the GRM at the local level to ensure transparency, social inclusivity, and ownership. Additionally, the SES system uses smart technologies like digitalization and geo-mapping

systems. These technologies improve efficiency by incorporating blended mechanisms for activities such as awareness-raising, consultations, meetings, impact assessments, communication, and outreach. The ESMF was disclosed on the Bank's website on April 25, 2023. A Labor Management Procedures, Resettlement Framework and Stakeholder Engagement Plan were disclosed on the Bank's website on April 26, 2023.

## V. GRIEVANCE REDRESS SERVICES

69. **Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the Bank's Grievance Redress Service (GRS).** The GRS ensures that complaints are promptly reviewed to address project-related concerns. Project-affected communities and individuals may submit complaints to the Bank's independent accountability mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred or could occur due to the Bank's non-compliance with its policies and procedures. The AM also houses a dispute resolution service, which allows communities and borrowers to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank management and after management has been given an opportunity to respond. For information on how to submit complaints to the Bank's GRS, please visit *http://www.worldbank.org/GRS*. For information on how to submit complaints to the Bank's AM, please visit *https://accountability.worldbank.org*.

## VI. KEY RISKS

70. **The overall risk rating for the project is assessed as moderate.** Most risk categories are considered moderate based on the substantial experience acquired in implementing similar activities under the PRDP. Fiduciary, environmental, and social risks are considered substantial, although strong mitigation measures will be implemented as discussed below.

71. **Fiduciary risks are substantial**. Given the expanded scope of the PRDP Scale-Up, there could be additional risks despite well-established procedures under PRDP supported by digitized instruments for document tracking. The added risks stem from the larger infrastructure contracts to be undertaken by LGUs, and the more complex issues of clustering involving larger enterprises. Additionally, the DA will be concurrently implementing the ongoing PRDP Second Additional Financing (completion on July 31, 2025), the MIADP (approved on May 26, 2023; completion on May 31, 2028), and FishCore (approved on May 30, 2023, completion on December 31, 2029). These initiatives all have similar functions in supporting public infrastructure and enterprises supporting the sector's transformation. As procurement and financial management will largely involve LGUs and FCAs, these categories have a substantial workload and risk rating. Mitigation measures were addressed during project preparation, and an ISAP was agreed upon (Annex 1). Measures will include: (a) providing in the POM the detailed systems and procedures to ensure effective and transparent LGU procurement, funds flow, contract management, internal audit, and M&E; (b) improving RPCO and PSO oversight through enhanced management information tools and systems that build on current IT systems; (c) raising awareness of World Bank fraud and corruption guidelines (World Bank 2016) among all personnel, proponents, LGUs, bidders, and entities within the MIADP sphere of operations; and (d) ensuring access, scope, coverage, and procedures for complaints handling and resolution is clear to all stakeholders, especially at the LGU level, and that the PSO will share complaint information with the Bank during implementation support missions.

72. **The environmental and social risks are substantial.** Environmental risks are substantial because subprojects will be located in sites that are intrinsically varied in physical characteristics, scope, and size. This increases the requirements for identifying risks and impacts environmental dimensions and scale. Mitigation measures for Component 2 (I-BUILD) and Component 3 (I-REAP) subprojects included in the POM will require implementing sustainable, climate-smart agricultural strategies and technologies. Mitigation measures are also included in the POM for the design and construction standards and requirements for infrastructure and enterprise subprojects. These, for example, could be related to earthmoving/cut and fill during land development, clogged drainage, and short-term pollution due to inadequate waste management, poor management of hazardous materials at construction sites, or low-intensity disturbance of the natural environment due to project activities. A program for capacity building on ESF requirements will be developed in coordination with the Philippine Learning Center for Environment and Social Sustainability to mitigate risks associated with hiring a significant number of new staff for the project. Social risks are substantial because of the large number of subprojects that will be implemented country-wide, where the exact locations are unknown beforehand. Even with the ESF and the innovations in project design, social risks will still be related to land acquisition and Indigenous Peoples, although the PRDP-SES team has extensive experience in these topics. Infrastructure subprojects will mostly entail the loss of agricultural land, trees, fences, and other small structures. In the Philippines, informal settler families are usually found near bodies of water, and the addition of bridges and fish landing subprojects may result in the physical relocation of households. While current members of the SES team are familiar with safeguards, risks associated with hiring new staff will be mitigated through focused ESF training. As the project will also operate in conflict areas, all SES staff must have conflict sensitivity and assessment training. Other actions will be implemented through strong stakeholder engagement activities included in the project design. This will mitigate risks associated with sexual exploitation and abuse/sexual harassment, whether in the community or the workplace, and avoid excluding vulnerable groups, including the poor and Indigenous Peoples.

## VII. RESULTS FRAMEWORK AND MONITORING

**Results Framework**
**COUNTRY: Philippines**
**Philippine Rural Development Project Scale-up**

### Project Development Objectives(s)

To improve farmers and fisherfolk access to markets and increase income from selected agri-fishery value chains

### Project Development Objective Indicators

| Indicator Name | PBC | Baseline | End Target |
|---|---|---|---|
| **Increased access to agricultural assets or services** | | | |
| Farmers reached with agricultural assets or services (CRI, Number) | | 0.00 | 450,000.00 |
| Farmers reached with agricultural assets or services - Female (CRI, Number) | | 0.00 | 225,000.00 |
| **Improved access to markets** | | | |
| Percent increase in volumes of marketed output (Percentage) | | 0.00 | 40.00 |
| **Increased income of farmers and fisherfolks** | | | |
| Percent increase in farmers and fisherfolk income derived from commodities and product forms (Percentage) | | 0.00 | 30.00 |

## Intermediate Results Indicators by Components

| Indicator Name | PBC | Baseline | End Target |
|---|---|---|---|
| **Component 1: National and Local Level Planning Component (I-PLAN)** | | | |
| Percent increase in the amount of agri-fishery investments in PCIPs supporting priority value chains (Percentage) | | 0.00 | 30.00 |
| Number of Regional Agriculture and Fishery Investment Portfolio (RAFIP) utilized in the DA annual work plan (Number) | | 0.00 | 15.00 |
| Percent of DA and LGU participants with improved knowledge in investment planning (Percentage) | | 0.00 | 90.00 |
| **Component 2: Rural Infrastructure and Market Linkage Component (I-BUILD)** | | | |
| Percent reduction in transport costs in roads linking production areas to markets (Number) | | 4.50 | 3.15 |
| Percent reduction in travel time of farmer/ fisherfolk from farm to market (Number) | | 10.00 | 6.00 |
| Cropping intensity in areas served with new/improved irrigation or drainage services (Percentage) | | 100.00 | 170.00 |
| Percent of completed climate-smart value chain infrastructure facilities operating as designed (Percentage) | | 0.00 | 90.00 |
| Kilometers of roads constructed (Kilometers) | | 0.00 | 1,174.00 |
| Area served with new/rehabilitated irrigation system (Hectare(Ha)) | | 0.00 | 2,517.00 |
| Number of value chain infrastructure facilities constructed as designed (Number) | | 0.00 | 62.00 |
| **Component 3: Enterprise Development Component (I-REAP)** | | | |
| Percent of agri-fishery enterprises engaged in postproduction segments of value chains. (Percentage) | | 0.00 | 60.00 |
| Percent increase in profitability of participating agri-fishery enterprises (Percentage) | | 0.00 | 40.00 |
| Percent of agri-fishery enterprise clusters reached by business | | 0.00 | 50.00 |

| Indicator Name | PBC | Baseline | End Target |
|---|---|---|---|
| development support including credit and insurance (Percentage) | | | |
| Percent of agri-fishery enterprise clusters with partnership agreement with institutional buyers (Percentage) | | 0.00 | 50.00 |
| Percent of women directly participating in clustered enterprises (Percentage) | | 0.00 | 50.00 |
| Number of agri-fishery enterprises (Number) | | 0.00 | 110.00 |
| **Component 4: Project Implementation Support Component (I-SUPPORT)** | | | |
| Number of institutionalized PRDP innovations including climate-smart technologies within the DA (Number) | | 0.00 | 10.00 |
| Enhanced Project's M&E system incorporating knowledge management (Yes/No) | | No | Yes |
| Percent of grievances registered in the project's grievance redress system addressed (Percentage) | | 0.00 | 90.00 |
| Percent of producers satisfied with adequacy of access to postharvest services and facilities (Percentage) | | 0.00 | 80.00 |

**Monitoring & Evaluation Plan: PDO Indicators**

| Indicator Name | Definition/Description | Frequency | Datasource | Methodology for Data Collection | Responsibility for Data Collection |
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| Farmers reached with agricultural assets or services | This indicator measures the number of farmers who were provided with agricultural assets or | Quarterly data collection and progress | Baseline study / PRDP Midterm Review report; | Data will be collected from completed and operational infrastructure and | NPCO MEL unit, supported by: (1) PSOs and RPCOs; (2) component-specific |

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| | services as a result of World Bank project support. "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture, agroforestry, timber, and non-timber forest products. Assets include property, biological assets, and farm and processing equipment. Biological assets may include animal agriculture breeds (e.g., livestock, fisheries) and genetic material of livestock, crops, trees, and shrubs (including fiber and fuel crops). Services include research, extension, training, education, ICTs, inputs (e.g., fertilizers, pesticides, labor), production-related services (e.g., soil testing, animal health/veterinary services), phyto-sanitary and food safety services, agricultural marketing support services (e.g., price monitoring, export promotion), access to farm and post-harvest | reporting; More in-depth semi-annual analysis and results reporting Midterm End-of-Project | Periodic Reports; Mid term / terminal report; sales /financial report of FCAs/farmer and fisher groups; Rapid Appraisal of Emerging Benefits (RAEB); Sample surveys, KIIs, FGDs Project-wide reports (component level and overall); service provider reports; GIS-supported Project-wide MIS accessible on-line | enterprise development investments. Use of standard project Data Capture Forms (DCF which is part of the web-based MIS) – both in e-format and in paper format – to collect/ generate complementary quantitative and qualitative on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking. | staff; and (3) technical assistance and resources (e.g., geo-tagging, satellite imagery, drone footage) as needed and detailed in specific Terms of Reference. NPCO M&E unit to ensure coverage of all data for use in contribution and attribution analysis linking component level outputs to overall PDO achievement |

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| | machinery and storage facilities, employment, irrigation and drainage, and finance. Farmers are people engaged in agricultural activities or members of an agriculture-related business (disaggregated by men and women) targeted by the project. | | | | |
| Farmers reached with agricultural assets or services - Female | | | | | |
| Percent increase in volumes of marketed output | The baseline in Yr 0 is 115,000 MT<br><br>This indicator tracks the proportion of the produce marketed in raw form of the beneficiaries of infrastructure and enterprise development of the Project.<br><br>by the end of the project, the project aims at 40 % increase over the baseline amounting to 161000 MT | Semi-annual data collection and progress reporting. Midterm End-of-Project | Baseline study / PRDP Midterm Review report; Periodic Reports; Mid term / terminal report; sales /financial report of FCAs/farmer and fisher groups; Rapid Appraisal of Emerging Benefits (RAEB); Sample | Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate complementary quantitative and qualitative on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | NPCO MEL unit, supported by: (1) PSOs and RPCOs; (2) component-specific staff; and (3) technical assistance and resources (e.g., geo-tagging, satellite imagery, drone footage) as needed and detailed in specific Terms of Reference. NPCO M&E unit to ensure coverage of all data for use in contribution and attribution analysis linking component level outputs to overall PDO |

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| | | | surveys, KIIs, FGDs Management information system (MIS) | | achievement |
| Percent increase in farmers and fisherfolk income derived from commodities and product forms | The baseline income level is PhP 42,000.<br>The project aims at 30 % increase over the baseline which is PhP55120<br><br>This indicator tracks changes in the real net on-farm and/or off-farm income of the beneficiaries directly attributable to infrastructure and enterprise development. Income increases will be averaged across commodities and product forms, using Year 0 figures as baseline. "Product forms" refer to processed commodities.<br><br>Information will be reported in gender-disaggregated form, where available | Semi-annual data collection and progress reporting.<br><br>Midterm<br><br>End-of-Project | Baseline study / PRDP Midterm Review report; Periodic Reports; Mid term / terminal report; sales /financial report of FCAs/farmer and fisher groups; Rapid Appraisal of Emerging Benefits (RAEB); Sample surveys, KIIs, FGDs Management information system (MIS) | Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate complementary quantitative and qualitative on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | NPCO MEL unit, supported by: (1) PSOs and RPCO; (2) on-site project staff, and component-specific staff; and (3) technical assistance and resources (e.g., for the conduct of market surveys, KIIs, FGDs) as needed and detailed in specific Terms of Reference. NPCO M&E unit to ensure coverage of all data for use in contribution and attribution analysis linking component level outputs to overall PDO achievement |

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| Monitoring & Evaluation Plan: Intermediate Results Indicators | | | | | |
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| **Indicator Name** | **Definition/Description** | **Frequency** | **Datasource** | **Methodology for Data Collection** | **Responsibility for Data Collection** |
| Percent increase in the amount of agri-fishery investments in PCIPs supporting priority value chains | Baseline is zero. A baseline survey will be conducted to determine the agri--fishery investments. By mid-term, it is expected that half of the target would be achieved.<br><br>Agri-fishery investments pertain to DA-wide financing to support value chain enhancements (investments) based on PCIPs. The percentage increase will be measured in terms of amount of investments in current prices. The results chain starts with PCIPs updated (immediate output) >> then PCIPs funded (immediate outcome). | Semi-annual data collection and progress reporting; More in-depth annual analysis and results reporting | Project-wide reports (component level and overall); DA Financial Management Service (FMS); GIS-supported Project-wide MIS accessible on-line; GAA PBP (DA and NGAs), AIP (LGUs), MOA (Private Sector) | Compilation of DA FMS records. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking. | NPCO MEL unit, supported by: (1) PSOs and RPCOs; (2) component-specific staff; and (3) technical assistance and resources (e.g., for the conduct of sample surveys, KIIs, FGDs) as needed and detailed in specific Terms of Reference. |
| Number of Regional Agriculture and Fishery Investment Portfolio (RAFIP) | By mid-term, it is expected that half of the target would | Semi-annual | DA Annual Plan and | Compilation of DA FMS records. Use of | NPCO MEL unit, supported by: (1) DA |

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| utilized in the DA annual work plan | be achieved.<br><br>The Regional Agriculture and Fisheries Investment Portfolio (RAFIP) would highlight PCIP multi-commodity and multi-provincial interventions in the region with potential for clustering and upscaling, based on regional analysis. The RAFIP will be integrated with the DA RFO Work and Financial Plan (WFP). | data collection and progress reporting; More in-depth annual analysis and results reporting | Budget Proposal | standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking. | RFOs; and (2) technical assistance and resources (e.g., for the conduct of sample surveys, KIIs, FGDs) as needed and detailed in specific Terms of Reference. |
| Percent of DA and LGU participants with improved knowledge in investment planning | Baseline is zero. A baseline survey will be conducted to determine the level of knowledge. Baseline value is set zero as this measures the increment. By mid-term, it is expected that half of the target would be achieved.<br><br>This indicator tracks the number of planning and program implementers (e.g. planners, budget and finance personnel, engineers, etc.) participating in “Ladderized training” (modular) on Investment | Annual data collection and progress reporting; Midterm End-of-Project | DA Annual Plan and Budget Proposal plus (1) pre- and post-training assessments; (2) LGU records; and (3) cap dev evaluation | Pre- and Post-test | I-PLAN Component staff at all levels |

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| | planning including but not be limited to planning tools, VCA, eVSA, and PCIP. The participants will include non-PRDP personnel. | | | | |
| Percent reduction in transport costs in roads linking production areas to markets | The baseline is PhP 4.50/kg. The project aims to reduce the costs by 30 %, which is PhP 3.15/kg<br><br>This measures the reduction in average transport cost of agri-fishery goods due to improved year-round/ climate-resilient connectivity between production areas to markets. | Semi-annual data collection and progress reporting (after subproject completion ); More in-depth annual analysis and results reporting Midterm End-of-Project | (1) Rapid Appraisal of Emerging Benefits (RAEB); (2) LGU engineering office (3) Baseline study / PRDP Midterm Review report; Periodic Reports; Mid term / terminal report; | Conduct of field assessment, compilation of relevant LGU reports; and interview of transport operators along project-financed roads and bridges. | NPCO MEL unit, supported by: (1) PSOs and RPCOs; (2) component-specific staff; and (3) technical assistance and resources (e.g., geo-tagging, satellite imagery, drone footage) as needed and detailed in specific Terms of Reference. |
| Percent reduction in travel time of farmer/ fisherfolk from farm to market | The baseline is 10 min/km. The project aims at 40 % reduction which is 6 min/km<br><br>This measures the reduction in the average travel time of | Semi-annual data collection and progress | (1) Rapid Appraisal of Emerging Benefits (RAEB); (2) LGU | Conduct of field assessment, compilation of relevant LGU reports; and interview of transport operators along | NPCO MEL unit, supported by: (1) PSOs and RPCOs; (2) component-specific staff; and (3) technical assistance and resources |

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| | beneficiaries due to access to climate-resilient connectivity-enhancing infrastructure.<br><br>Information will be reported in gender-disaggregated form, where available | reporting (after subproject completion ); More in-depth annual analysis and results reporting Midterm End-of-Project | engineering office (3) Traffic study, baseline study / PRDP Midterm Review report; Perio dic Reports; Midterm / terminal report; | project-financed roads and bridges. | (e.g., geo-tagging, satellite imagery, drone footage) as needed and detailed in specific Terms of Reference. |
| Cropping intensity in areas served with new/improved irrigation or drainage services | Baseline is 100 %. A baseline survey will be conducted to confirm the intensity. This measures the average increase in cropping intensity (i.e., effective area cultivated per year) served with new/improved irrigation by the Project. | Annual data collection and progress reporting (after subproject completion ) | DA banner program directorates; LGU agriculture offices Baseline study, Periodic Reports; Mid term / terminal report; RAEB | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | MEL unit, supported by: (1) DA RFOs; and (2) technical assistance and resources (e.g., for the conduct of sample surveys, KIIs, FGDs) as needed and detailed in specific Terms of Reference. |
| Percent of completed climate-smart value chain infrastructure facilities operating as | Baseline is zero. By mid-term, it is expected that | Annual data | OMAS results of total | Compilation of records from identified data | I-BUILD Component and MEL unit, supported by |

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| designed | one-third of the target (30%) would be achieved.<br><br>This is defined as a percentage of total infrastructure sub-projects financed by the project. This indicator assesses the performance of completed project-financed infrastructure – based on PCIPs and RAFIPs – vis-à-vis standard criteria to include functionality and physical appearance. | collection and progress reporting (after subproject completion ); | completed subprojects Periodic Reports, PRDP MIS with geotag photos | sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format. | DA RFOs (ROMAT). |
| Kilometers of roads constructed | Baseline is zero. By mid-term, it is expected that one-third of the target (30%) would be achieved. | Semi-annual data collection and progress reporting (after subproject completion ); More in-depth annual analysis and results reporting | LGU agriculture offices Baseline study, Periodic Reports; Mid term / terminal report; RAEB | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | I-BUILD Component and MEL unit, supported by DA RFOs (ROMAT). |

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| | | Midterm<br>End-of-Project | | | |
| Area served with new/rehabilitated irrigation system | Baseline is zero. By mid-term, it is expected that one-third of the target (30%) would be achieved. | Semi-annual data collection and progress reporting (after subproject completion); More in-depth annual analysis and results reporting<br>Midterm<br>End-of-Project | LGU agriculture offices Baseline study, Periodic Reports; Mid term / terminal report; RAEB | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | I-BUILD Component and MEL unit, supported by DA RFOs (ROMAT). |
| Number of value chain infrastructure facilities constructed as designed | Baseline is zero. By mid-term, it is expected that one-third of the target (30%) would be achieved. | Semi-annual data collection and progress reporting | LGU agriculture offices Baseline study, Periodic Reports; Mid | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to | I-BUILD Component and MEL unit, supported by DA RFOs (ROMAT) |

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| | | (after subproject completion); More in-depth annual analysis and results reporting Midterm End-of-Project | term / terminal report; RAEB | collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | |
| Percent of agri-fishery enterprises engaged in postproduction segments of value chains. | Baseline is zero/TBD. A baseline survey will be conducted to determine the baseline level. Baseline value is set zero as this measures the incremental change. By mid-term, it is expected that one-third of the target (20%) would be achieved.<br><br>This is measured as a percentage of total agri-fishery enterprises participating in project. The Philippine Development Plan 2023-2028 highlights lack of post-harvest facilities | Semi-annual data collection and progress reporting. Midterm and End-of-Project in-depth evaluation | Agri-fishery enterprise records Survey (Midterm, PCR) Rapid Appraisal of Emerging Benefits (RAEB) | Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate complementary quantitative and qualitative on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking. | NPCO MEL unit, supported by: (1) PSOs and RPCO; (2) on-site project staff, and component-specific staff; and (3) technical assistance and resources (e.g., for the conduct of market surveys, KIIs, FGDs) as needed and detailed in specific Terms of Reference. NPCO M&E unit to ensure coverage of all data for use in contribution and attribution analysis linking component level outputs to overall PDO |

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| | as one bottleneck to food security. I-REAP subprojects will strengthen common service facilities, e.g., to process raw produce. In this regard, this indicator tracks the extent to which enterprises are shifting away from purely production ventures, and diversifying towards higher-income, value-adding products forms. | | | | achievement. |
| Percent increase in profitability of participating agri-fishery enterprises | Baseline value is set TBD/zero as this measures incremental changes. Once the baseline survey is conducted, baseline value will be updated. By mid-term, it is expected that one-third of the target (13%) would be achieved.<br><br>This indicator tracks returns to investment. While "profit" refers to a peso amount, "profitability" is understood to mean sustained annual increases in enterprise net profit resulting from PRDP | Semi-annual data collection and progress reporting. Midterm and End-of-Project in-depth evaluation | Agri-fishery enterprise records Survey (Midterm, PCR) Rapid Appraisal of Emerging Benefits (RAEB) Supply or marketing contracts, Purchase Orders, Regularity of transactio | Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate complementary quantitative and qualitative on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking. | NPCO MEL unit, supported by: (1) PSOs and RPCO; (2) on-site project staff, and component-specific staff; and (3) technical assistance and resources (e.g., for the conduct of market surveys, KIIs, FGDs) as needed and detailed in specific Terms of Reference. NPCO M&E unit to ensure coverage of all data for use in contribution and attribution analysis linking component level outputs to overall PDO |

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| | business models, rather than seasonal/ fluctuating increases. Profitability is affected by factors such as the enterprise's productivity, operational efficiency, and expenses; and external factors such as market demand and competition. | | ns based on sales or delivery receipts of enterprises to institutional buyers i.e. processors, exporters, consolidators, HORECA, government institutions, etc. | | achievement. |
| Percent of agri-fishery enterprise clusters reached by business development support including credit and insurance | Baseline is set zero as this measures incremental changes. A baseline survey will be conducted. By mid-term, it is expected that one-third of the target (17%) would be achieved.<br><br>The indicator defines the enterprises linked with technical and business development support service providers and institutions. | Annual data collection and progress reporting (A year after subproject completion); | Enterprise Operations Monitoring PRDP MIS, Interviews, Periodic Reports, RAEB | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format. | I-REAP Component and MEL unit, supported by PSOs and RPCOs. |

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| Percent of agri-fishery enterprise clusters with partnership agreement with institutional buyers | Baseline is zero, as this measures incremental changes as a result of project interventions. By mid-term, it is expected that one-third of the target (17%) would be achieved.<br><br>This measures the agri-fishery linked to institutional buyers through either formal agreements, i.e., through contracts, purchase orders, etc. | Annual data collection and progress reporting (A year after subproject completion); | Enterprise Operations Monitoring PRDP MIS, Interviews, Periodic Reports, RAEB | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format. | I-REAP Component and M&E unit, supported by PSOs and RPCOs |
| Percent of women directly participating in clustered enterprises | Baseline is zero, as this measures incremental changes as result of interventions. By mid-term, it is expected that one-third of the target (17%) would be achieved.<br><br>This is measured as a percentage of total number of women participating in the project. This indicator measures the degree to which women participate actively – and benefit from – targeted value chain segments (e.g., processing, | Annual data collection and progress reporting (A year after subproject completion);<br>End-of-Project | Enterprise Operations Monitoring | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format. | I-REAP Component and M&E unit, supported by PSOs and RPCOs. |

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| | marketing) at the enterprise level. | | | | |
| Number of agri-fishery enterprises | Of the target of 110 enterprises, 50 are small enterprises, 50 are medium enterprises, and 10 are large enterprises.<br><br>Baseline is zero. By mid-term, it is expected that one-third of the target (30%) would be achieved. | Semi-annual data collection and progress reporting (after subproject completion); More in-depth annual analysis and results reporting Midterm End-of-Project | Enterprise Operations Monitoring PRDP MIS, Interviews, Periodic Reports, RAEB | Compilation of records from identified data sources. Use of standard project Data Capture Forms (DCF) – both in e-format and in paper format – to collect/ generate on-site data that will enable robust performance progress and results synthesis, analyses, reporting, and feedbacking | I-REAP Component and M&E unit, supported by PSOs and RPCOs |
| Number of institutionalized PRDP innovations including climate-smart technologies within the DA | This indicator counts the number of innovations (e.g., climate-resilient value chain analysis) adopted in regular DA programs.<br><br>By mid-term it is expected that half of the target would be achieved | Annual Midterm End-of-Project | DA offices Institutional Development / Mainstreaming Monitoring forms | Survey interviews such as KII, FGDs | IDU and MEL |

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| Enhanced Project's M&E system incorporating knowledge management | This indicator tracks the enhancement (or improvement) of the project M&E system by integrating Knowledge Management, which results to a Monitoring, Evaluation and Learning (MEL) System, aimed at leveraging learning supported by properly collected, managed, and analyzed data to improve decision-making and promote replication of good practices. | At the end of Year 1 of implement ation Annual Midterm End-of-Project | NPCO MEL Unit and DA ICT Service | Observation of system enhancement based on set parameters and its day-to-day operation<br>MOV: KM Assessment Reports<br>Activity: Annual KM/MEL Assessment<br>Methodologies:<br>KII and FGD, Diagnostic questionnaires, and analysis<br>Review of KM platforms. | NPCO MEL unit |
| Percent of grievances registered in the project's grievance redress system addressed | This measures the project's response rate based on the Grievance Redress Mechanism (GRM) database. By mid-term, it is expected that one-third of the target (30%) would be achieved. | Semi-annual data collection and progress reporting; More in-depth semi-annual analysis and results reporting | Grievance redress system records; random interviews | Compilation and review of grievance data | Project's SES and M&E units. |

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| Percent of producers satisfied with adequacy of access to postharvest services and facilities | By mid-term, it is expected that one-third of the target (27%) would be achieved.<br><br>This indicator seeks to draw out perceptions of farmers and fisherfolk about how the project is improving their access to services and facilities and thus enabling them to improve income and market access.<br><br>Information will be reported in gender-disaggregated form, where available | Semi-annual data collection and progress reporting; More in-depth semi-annual analysis and results reporting | Sample survey and FGD results | Perception survey, supplemented by FGDs | NPCO MEL unit |

## ANNEX 1: Implementation Arrangements and Support Plan

**COUNTRY: Philippines**
**Philippine Rural Development Project Scale-Up**

### Institutional Arrangements

1. **The project will be national and run under the direction of the DA Secretary through the Office of the DA Undersecretary for Operations.** The institutional arrangements will be the same as for the ongoing PRDP project. Under the direction of the Assistant Secretary for Operations, the PRDP-NPCO will manage the overall PRDP Scale-Up project. The existing NPAB for PRDP, which is responsible for approving policy and refinements of procedures and monitoring overall project performance, will be replaced by an NPSC. The NPSC will have the same functions as NPAB but will also provide oversight for other World Bank-supported DA projects, including FishCore and MIADP. This will enable the harmonization of policies and core processes between projects and facilitate their mainstreaming as part of DA's regular programs. The NPSC comprises multi-agency, farmer, and other stakeholder representatives and is responsible for approving policy and procedure refinements and monitoring overall project performance. The NPCO will provide the secretariat for the NSPC.

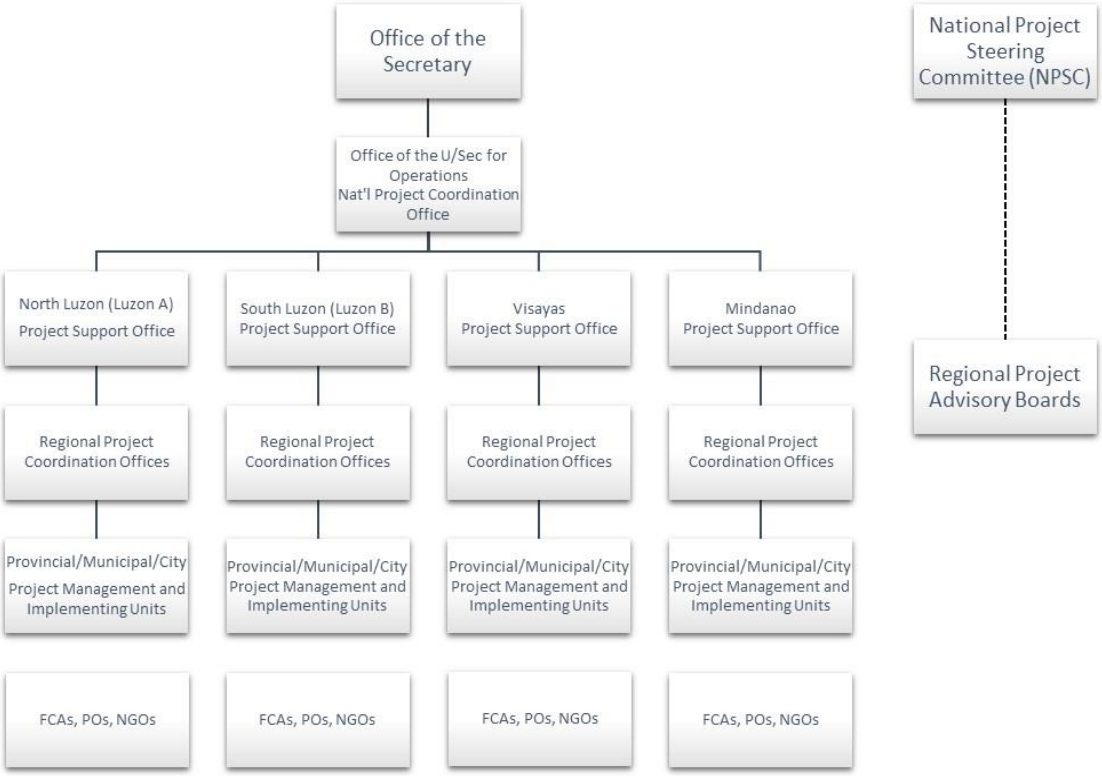
2. **The project will be implemented at the regional level through DA's RFOs, which report to the Undersecretary for Field Operations and through that office to the Secretary of Agriculture.** RFOs, under the Regional Executive Directors, are responsible for all DA activities in their respective regions. For implementing PRDP and the follow-on PRDP Scale-Up, RFOs have been clustered into four groups based on geographical location: North Luzon, i.e., Luzon A comprising Cordillera Administrative Region and Regions 1, 2, and 3; South Luzon, i.e., Luzon B comprising Regions 4A, 4B, and 5; Visayas, comprising Regions 6, 7, and 8; and Mindanao, comprising Regions 9, 10, 11, 12, 13, and BARMM. The RFO of BARMM is represented by the BARMM's MAFAR.

3. **The four RFO groupings or clusters are each supported by a PSO, which is hosted by one of the RFOs within each grouping.** Administrative, legal, and technical staffing of the PSO is drawn from the RFOs and complemented by additional staff hired under both the ongoing PRDP and PRDP Scale-Up. The PSO provides technical, fiduciary, ESS and M&E review and backstopping support to each of the RFOs within its grouping. More specifically, support is provided to RPCOs established in each RFO to manage the components of the PRDP and PRDP Scale-Up, i.e., planning (I-PLAN), infrastructure (I-BUILD), enterprise (I-REAP), management (I-SUPPORT), and CERC. The BARMM's RPCO is under MAFAR.

4. **Existing RPABs comprising local multi-agency, farmer, and other stakeholder representatives will continue to function under the PRDP Scale-Up.** RPABs approve subproject proposals and facilitate the harmonization of approach and convergence (inter-institutional linkages). RPCOs provide the secretariat functions for the RPABs.

5. **At the local level, partnership arrangements between the DA and LGUs are established through MOAs that define responsibilities for implementing the PRDP.** MOAs require each LGU to establish PMIU with responsibilities for implementing subprojects at the provincial, city, or municipal level.

***Figure A1.1. Project Institutional and Implementation Arrangement***




6. **PCIPs, now institutionalized through PRDP, will be further utilized and strengthened as the collaborative planning instrument between the DA and the LGUs and for supporting investments under the PRDP Scale-Up.** The PCIPs provide an effective platform through which the DA rationalizes its localized support for productivity strengthening. The commodities and investments supported through the PCIPs are based on national priorities as determined through the Agriculture and Fisheries Modernization Plan (AFMP). Particular support will be provided under the PRDP Scale-Up for strengthening spatial planning to underpin more strategically-focused regional-AFMPs. The suitability of the areas for commodities is determined through the eVSA tool, which considers environmental, edaphic, and socio-economic factors. The type of interventions supported is subsequently determined through VCAs. All 82 provincial LGUs have adopted PCIPs which provide a planning framework for convergence (integration) with other government agencies and the private sector[14].

[14] The PCIP process has been widely supported at the Provincial level and by other government departments and oversight agencies.

7. **A comprehensive POM developed through PRDP will be refined before the project effectiveness to include additional detail needed to implement the PRDP Scale-Up**. In particular, this will include strengthened environmental screening and construction standards and enhanced operational procedures to streamline the process. The POM details the technical and procedural process for selection, design, implementation, procurement, safeguards, O&M, and M&E of subproject investments for both infrastructure and enterprise development. These manuals are subject to periodic review and updating to accommodate the evolving opportunities and needs of the project, including the VCA analytical methodology.

8. **The PRDP Scale-Up will incorporate the PRDP's strong governance provisions that have been reinforced through several in-house initiatives developed by the DA.** These include: (a) applied geotagging, which is used for subproject identification, validation, monitoring, and supervision through a Google Earth-based mapping system, promoting transparency and public disclosure; (b) UAVs which enhance subproject monitoring progress and impact evaluation; (c) an electronic system of no objection (eNOL) which expedites processing, tracking and approval of procurement (NOL1) or construction (NOL2); (d) the document tracking system which provides a web-based system for NPCO, PSOs and RPCOs to trace the phasing and flow of all documents; (e) citizen monitoring which provides a checklist and a feedback mechanism through which beneficiaries of infrastructure investments can participate in the monitoring of contractor performance; (f) online grievance redress[15]; (g) PRDP Go! app and Geo-video that provides subproject details and maps and allows public uploading of comments and photos on the PRDP-supported investments and creating a video of the infrastructure subprojects complementing the geotagged pictures; and (h) the management and information system (MIS), a web-based platform providing real-time, automated data collection and project monitoring from budgeting through implementation and which is aligned with other government systems and protocols, including the DPWH electronic project lifecycle (e.g., construction schedule and progress S-Curve)[16]. Further digitalization will be supported under the project, particularly for the "Rural Road Network Strategic Overlay" (I-ROAD) as the basis for planning, budgeting, and construction of the country's rural road network in partnership with LGUs and DPWH.

9. **Capacity to implement the PRDP Scale-Up builds on the successful track record of the ongoing project operating since 2014 and complemented through two additional financings.** Note, the AF2 loan closing is July 31, 2025. Current staffing of the NPCO, PSOs and RPCOs comprises some 1,033 staff working nationwide: 12 full-time DA staff, 368 part-time DA staff, and 733 contracted staff. The PRDP Scale-Up will further enhance this capacity and the overlap with the ongoing PRDP project will maintain the momentum of operations, avoid staff redeployment, and continue the integration and mainstreaming of practices. LGUs across the country have also strongly supported the staffing and work of their PMIUs which have undergone considerable capacity strengthening through implementing the PRDP. This will be enhanced through the PRDP Scale-Up.

10. **SES units have been established at national (NPCO), PSO and regional (RPCO) levels of project organization within the DA, while all participating LGUs have designated safeguard focal persons in their PMIU.** These

For example, 77 LGUs have reported leveraging PhP82.04 billion. This amounts to 65 percent of total funding from PRDP and non-PRDP sources. It has come from NGAs 75.4 percent, LGUs 24 percent and private sector (mainly NGOs) 0.15 percent.

[15] A PRDP study found that most stakeholders prefer face-to-face interaction for grievance redress.

[16] The web-based MIS system has been recognized as best-practice across government departments of the Philippines and internationally.

arrangements will continue to support the PRDP Scale-Up. Additional staff will be hired when needed. Through the PRDP, several innovations and refinements in procedures, protocols, forms and templates have been institutionalized, and safeguard capacity has been strengthened through training, workshops and learning-by-doing facilitated by joint NPCO-PSO-RPCO reviews.

11. **The PRDP Scale-Up will adopt the same SES measures instituted under the ongoing PRDP project for operating in conflict environments.** Procedures detailed in the POM ensure, for example, that minority groups, including Indigenous Peoples and their representatives are included and present in consultations, and that local labor is hired to implement subprojects. These procedures have been elaborated on under the World Bank-supported MIADP (DA 2021), which supports Indigenous communities in ancestral domains of Mindanao, including BARMM. MIADP is being implemented by the DA through the same institutional and operational arrangements as the PRDP Scale-Up, ensuring synergies and consistency in approach. Based on experiences under the PRDP working in BARMM, treating potential conflict areas differently from other project areas has not been necessary. From preparing PCIPs to reviewing, approving and monitoring the subproject, the safeguard requirements, procedures, and approaches will be similar under the PRDP Scale-Up[17].

12. **Institutional strengthening will continue using digital applications and innovations.** Through the ongoing PRDP, a comprehensive set of procedures have been instituted and supported through various digitized and web-based tools to mitigate fraud and corruption risks and improve accountability and overall quality of investments and service delivery. These, as summarized in Box A1.1, will be further elaborated under the project.

**Box A1.1. Digital Applications and Innovations to be further Developed and Institutionalized under the PRDP Scale-Up**

Through its in-house information and communications technology (ICT) capacity developed and implemented under PRDP, the DA has been at the forefront of developing innovative digital and web-based applications. These will be further developed under PRDP Scale-Up and mainstreamed across DA bureaus and attached agencies. They encompass various functions such as administration and document tracking; subproject identification, climate and edaphic suitability analysis, prioritization, design, implementation and O&M monitoring; and citizen engagement for subproject feedback and grievance redress. These applications and innovations include the following:

- The Planner's Portal with key data that strengthens planning, decision-making and e-Learning. The platform includes climate information, maps for better visualization, and decision support tools.
- An electronic system of no objection (eNOL) that expedites and documents decision processes.
- A document tracking system that provides a web-based system to trace the phasing and flow of all documents.
- An expanded vulnerability and suitability analysis (eVSA), climate risk vulnerability assessment (CRVA) and

[17] In BARMM, landholding claims often are not formally documented. Landowners usually have tax declarations but no land titles. This limits their ability to voluntarily donate their lands if they so wish. In lieu of donation, project-affected persons (PAPs) have the option to waive their claims to their entitlements for their losses. However, in accordance with the Integrated Environmental and Social Safeguards Framework (IESSF), PAPs need to be aware of their entitlements before they can donate or waive their claims. Public consultations among PAPs are conducted to explain the subproject's impacts, the process of acquisition of their properties, their entitlements based on the IESSF, etc. These consultations are documented and checked during subproject monitoring.

hazard mapping that determines and prioritizes the edaphic and climate suitability of production areas and commodities to be supported. The eVSA is a GIS-based tool that considers the combined analysis of a particular area's vulnerability, suitability, and socio-economic conditions. The CRVA is used to plan and implement strategies to help agri-fishery communities manage climate risks.

- A private sector/industry digital platform that provides feedback for decision-makers on markets, innovation, and industry bottlenecks.
- A web-based management information system that provides real-time, automated data collection and project monitoring, from budgeting through implementation, that aligns with other government systems and protocols, including the DPWH electronic project lifecycle, e.g., construction schedule and progress S-curve.
- An FMR network plan that mainstreams a harmonized screening guide to rationalize FMR investments based on access needs and climate vulnerability across government agencies.
- Applied geotagging that provides a system to promote transparency and public disclosure for subproject identification, validation, monitoring, and supervision through Google Earth-based mapping.
- Use of unmanned aerial vehicles (UAVs), i.e., drones, that enhances subproject validation by monitoring progress and evaluating impact.
- Citizen monitoring that provides a checklist and a feedback mechanism through which infrastructure investment beneficiaries can help monitor contractor performance.
- Online grievance redress.
- The PRDP GeoCamera App that captures geotagged photos and videos and provides subproject details and maps and allows public uploading of comments, photos, videos, and geotagged pictures on project-supported investments.

13. **Workshops were held to identify opportunities for further institutional strengthening.** Given the added scope and scale of interventions under the PRDP Scale-Up, a series of workshops were conducted during preparation with staff of PSOs, RPCOs, LGUs and contractors, to review and discuss institutional/implementation issues. A number of areas and opportunities were identified for further Institutional strengthening. Key areas examined were the: (a) effectiveness of LGUs procurement, funds flow, contract management, and M&E; (b) efficiency and effectiveness of RPCOs and PSO oversight functions; (c) awareness of World Bank Fraud and Corruption Guidelines[18] among all personnel and entities within the PRDP sphere of operations; (d) access, scope, coverage, and procedures for complaints handling and resolution, especially for complaints from the LGU level; and (e) need for harmonization of POMs across DA projects and programs, and especially for World Bank supported DA projects, i.e., PRDP, PRDP Scale-Up, MIADP and FishCORE. In light of these findings, a number of actions have been proposed for incorporation into the project design as discussed in Component 4 and summarize in Table A1.1.

**Table A1.1. Key Institutional Strengthening Actions to be Pursued under Component 4**

| Activities | Responsible Unit |
|---|---|
| **LGU Capacity Support** | |
| a. Review and follow-up to ensure LGUs' capacity is appropriate and in accordance with requirements of the MOA and IMAs, e.g., in regard to fiduciary, M&E, complaints handling, access by the PRDP internal audit function to documents and systems, | Compliance Unit (Legal) and Admin |

[18] Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by the IBRD Loans and IDA Credits and Grants (revised 2016)

| Activities | Responsible Unit |
|---|---|
| compliance requirements, and staffing, training, resources, and salary standards. | |
| b. Strengthen awareness and implementation of LGU project implementation staff and key executives of requirements and procedures for: (a) compliance with World Bank fraud and corruption guidelines, e.g., through including discussion on this in pre-bid conferences; (b) procurement, funds handling, contract management and monitoring, and the prohibition of conflicts of interest and other provisions of the code of ethics; and (c) elevation of "red flags" relating to fraud, collusion, and corruption, including the process for review and resolution of such issues. | Procurement and FM |
| c. LGUs to ensure access to all documents and key personnel by the enhanced internal audit function. | Compliance Unit, Admin, Procurement and FM |
| d. Support the harmonization of DA-LGU fiduciary, M&E procedures, etc., across DA-implemented projects, especially those supported by the World Bank, i.e., PRDP, PRDP Scale-Up, MIADP, and FishCore. | Procurement, FM, M&E, |
| **Project Management and Oversight** | |
| a. Establish an internal grievance mechanism for reporting administrative issues that will ensure: (a) an effective way of resolving fraud and corruption complaints and issues such as discrimination and misconduct; and (b) a confidential process through which staff can securely raise concerns. | SES and Admin |
| b. Review and update the external grievance mechanism to ensure it remains effective and efficient. | SES |
| c. Create an internal audit committee to which the program's enhanced internal audit function will report every six months. Internal audits will be conducted for each province or relevant LGU participating in I-BUILD and randomly selected Implementing Proponents for I-REAP. | PDs, DPDs and Admin (NPCO, PSOs and RPCOs) |
| d. Conduct thematic workshops to promote in-depth discussions and development of recommendations to help ensure efficient project implementation. Such topics could include procurement/contracting concerns, e.g., handling low-ball bids and variations; knowledge creation and information sharing; the effectiveness of investments in NAFMIP's transformation strategies; digital tool/platform requirements, and their effective use by management and staff. These activities will be complemented by monitoring key activities under the PRDP Scale-Up and MIADP by new anti-corruption specialists and officers; at least two staff for the PRDP Scale-Up. | Procurement, FM and M&E |

**Financial Management Arrangements**

14. **The DA's current financial management system will be used to implement the project.** It includes acceptable budgeting, funds flow, accounting, reporting, internal controls, staffing and audits. DA has a robust information system enabling it to regularly report project implementation progress.

15. **Adequate FM staff resources exist at the NPCO, PSO, and RPCO levels.** This will ensure timely completion of the financial reports, monitoring of the designated accounts, including modified disbursement system (MDS) subaccounts and secondary project accounts, and preparation of withdrawal applications. Due to the qualified opinion of the COA on the DA's financial statements during 2019 –2021, separate books of account for the project will be maintained at the RPCOs, PSO, and the DA Central Office.

16. **Budget proposals are prepared annually by the DA and submitted to the Department of Budget and Management (DBM) for review before being incorporated into the National Expenditure Program (NEP) which is then submitted to the evaluation of Congress prior to its consideration in the General Appropriations Act.** Accordingly, an annual work and financial plan and disbursement projections for the project will be submitted to the Bank before the start of each fiscal year.

17. **Accounting:** The accounting records of the project will be maintained by the NPCO, PSOs and RPCOs using the NGAS chart of account. The electronic NGAS' (eNGAS) financial management system will be used to maintain the accounting records.

18. **Internal controls/internal audit:** The project will follow the internal controls and policies found in NGAS, the Government Audit and Accounting Manual, COA, DBM memoranda and circulars, and other laws and regulations. The respective DA FM staff at all levels will review supporting documents for project disbursements. Specifically, the following requirements shall be implemented for the project:
    a. Subsidiary records shall be maintained for the designated account, related MDS subaccounts, and secondary project accounts.
    b. Quarterly bank reconciliation statements shall be required to be prepared one month after the end of each quarter, together with the trial balance.
    c. Annual physical inventory count of fixed assets shall be conducted, and results reconciled with the accounting and property records.

19. **FM-related capacity building will be carried out in LGUs, as part of the institutional strengthening.** The project will include the respecting LGUs in FM capacity-building activities:
    a. Creation and capacitating of an internal audit function in each participating proponent LGUs and FCAs/FCA clusters, staffing this function and providing it with sufficient resources to carry out its duties. This could be included as one of the provisions/requirements in the implementation management agreement. As amended, the MOA and IMA will obligate the PRDP and the proponent LGUs and FCAs/FCA clusters to ensure that internal auditors are fully oriented on the procedures and systems of the PRDP.
    b. The PRDP shall create an internal audit unit/committee within it with multiple functions. Firstly, it will train and oversee internal auditors. Secondly, it will help form an internal audit function within the proponent LGUs and FCAs/FCA clusters. The unit will regularly check PRDPs own key controls of systems. The PRDP internal audit unit/committee will also serve as a platform for internal auditors to raise concerns in case there is inaction in the proponent LGUs and FCAs/FCA clusters. If possible, PRDP recommends that matters be raised with and resolved by this committee.

20. **Financial Reporting Arrangements.** Through the NPCO, the project will prepare and submit unaudited IFRs within 45 days after the end of each calendar quarter, consisting of the following: (a) sources and uses of funds; (b) variance analysis; and (c) a designated account activity statement.

21. **Disbursement Arrangements and Fund Flow**. The loan and subgrants shall be disbursed over a period of five years in accordance with the financial plan of the project and on the expenditure categories shown in Table A1.2. A loan from the World Bank will finance the project. The national government will provide the government counterpart requirements, the participating LGUs and FCAs. The loan proceeds will flow from the World Bank to the Bureau of Treasury account at the Central Bank of the Philippines. After the issuance

of the notice of cash allocation by the DBM, the funds will be credited to the MDS account of the project to be maintained by the NPCO. The MDS account shall be maintained at the Land Bank of the Philippines, an authorized government depository that is acceptable to the World Bank (Figure A1.1).

**Table A1.2. Category of Eligible Expenditures**

| Category | Amount of the Loan Allocated (in US$ million) | Percentage of Expenditures to be Financed (Inclusive of Taxes) |
|---|---|---|
| **(1) Goods, works, non-consulting services, consulting services, enterprise subgrants, infrastructure subgrants, operating costs, and training for the project** | **600** | **100 % of the amount disbursed for the enterprise and infrastructure subgrants**<br><br>**100 % for all other eligible expenditures** |
| **(2) Emergency expenditures** | **0** | **100 %** |
| **TOTAL** | **600** | |

22. The disbursement methods allowed under the project are: (a) advance; (b) direct payments; (c) reimbursements; and (d) special commitments. The proposed minimum value of the application for direct payments, reimbursements and special commitments is US$5 million. A peso MDS subaccount for the project shall be opened and maintained by the NPCO at the Land Bank of the Philippines to download funds from the Bureau of Treasury to pay for project's eligible expenditures. Secondary project accounts in PhP managed by the PSOs and RPCOs will be opened at authorized government depository banks to receive the advance from NPCO for PSO and RPCO operating costs.

23. The DA shall withdraw funds from the World Bank by submitting online withdrawal applications, supported by quarterly IFRs indicating cash forecast/requirements for six months. Disbursements under the project shall comply with the World Bank policies and procedures on disbursements and FM, as reflected in the Bank's disbursements handbook and FMR guidelines. All disbursements from the designated account shall only be for eligible expenditures based on the agreed eligibility/financing percentage in the loan agreement and shall have adequate supporting documents. Attachments of supporting documents to the withdrawal applications shall be based on threshold limits specified in the disbursement and financial information letter. The frequency for reporting eligible expenditures paid from the designated account will be quarterly through the IFR or as necessary. The project will be granted a four-month grace period to report these eligible expenditures to allow the submission of withdrawal applications and supporting documentation for expenditures incurred on or before the loan closing date. Figure A1.2. presents an overview of the funds flow.

24. Project fund requirements will be downloaded from the NPCO to the four PSOs covering clusters of regions based on six (6) months' requirements. The funds will include the following:
    a. Infrastructure subproject funds
    b. Enterprise subproject funds
    c. Operating fund requirements by the RPCO (RFO/units)

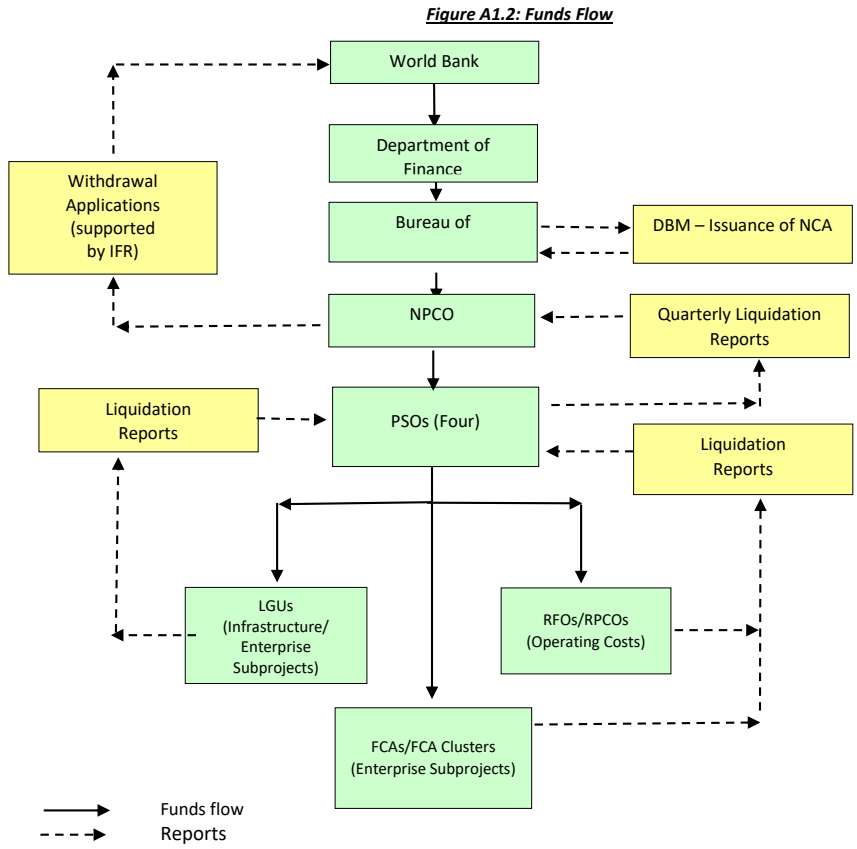
25. For infrastructure subprojects' subgrants, the funds will be disbursed by PSOs directly to the LGUs in accordance with IMA between DA and LGUs. Funds to be downloaded will be based on actual physical accomplishment for infrastructure subprojects. The amounts to be disbursed to the LGUs are treated as advances and will be recorded as expenditures upon liquidation or submission of reports on actual expenditures.

26. For enterprise subprojects subgrants, funds downloaded/disbursed by the PSO to LGU/FCA/FCA clusters will be treated as advances and subject to liquidation. The Bank will document expenditures based on the actual spending of LGU/FCA/FCA clusters. Any amounts disbursed for the subgrants and not spent by the respective participating LGU/FCA/FCA cluster by the closing date should be refunded to the Bank.

27. PSOs will download operating funds to RPCOs based on 6-month disbursement forecast/requirements for the project and will be treated as advances and subject to liquidation. Subsequent fund downloads will be in accordance with the detailed procedures in the FM section of the operations manual.

28. **External audit:** The COA, the auditor for all government agencies in the Philippines, will conduct the audit of the Project Financial Statements. COA has extensive experience in auditing government agencies and World Bank-funded projects and is an auditor acceptable to the Bank. The audit will cover various levels, such as LGUs, RPCO, PSO, and NPCO. The consolidated audit report will be submitted to the Bank within six months of the end of the financial year. Early engagement of the COA auditors and agreement on the audit timelines will be obtained to prevent substantial delays in the submission of the audit reports.

*Figure A1.3. Funds Flow*




**Procurement**

29. **Processes are well defined in the procurement modules for PRDP, however, given the scale-up of activities, including variation in the implementation of enterprise components, a more strategic design is needed to implement the procurement under the proposed project.** There is a need to operationalize a system befitting a matured implementing unit whereby duplications will be avoided while ensuring coverage of all requirements under a multi-layer organization (RPCOs, PSOs, and NPCO). To this end, the project should ensure that efficient timelines (service standard) are drawn in the procurement processing and in pre- and post-procurement activities to reflect a seamless transition through the various stages of project implementation.

30. **The DA, RFOs, and LGUs existing procurement structure will directly implement the procurement at their respective levels.** This structure includes including the Bids and Awards Committee, Technical Secretariat/Working Group, and FCAs. In circumstances where the FCA's capacity is weak, LGUs may implement the procurement on their behalf. As the project will involve many of the same staff at the DA as those involved with PRDP, adequate capacity and procurement experience exists for oversight. However, in the case of the LGUs and FCAs, capacity building may be needed, especially for entities and/or personnel with no or little experience with the agreed procurement arrangements.

31. **All procurement of goods, works, non-consulting and consulting services under the project shall be carried out and governed by the World Bank Procurement Regulations for IPF Borrowers (November 2020) and the provisions stipulated in the loan agreement and PP.** The project will be subject to the World Bank's anti-corruption guidelines (dated October 15, 2006, revised in January 2011, and as of July 1, 2016). The project will use the STEP to plan, record, and track procurement transactions. The general description of various items under different expenditure categories, to be assessed in the PPSD, and to be financed by the Bank are described below:
    a. **Works:** FMRs, bridges, irrigation systems, potable water systems, postharvest facilities/infrastructure, and other infrastructure.
    b. **Goods:** Agricultural and fishery support equipment, ICT, monitoring and other equipment, and vehicles.
    c. **Consulting services:** Technical assistance for operations and implementation activities and capacity building; conducting of feasibility studies and surveys, detailed engineering designs, construction supervision and quality oversight; and monitoring and evaluation support. Individual consultants will also be hired as technical experts to support the NPCO, PSOs, RPCOs, LGUs, and FCAs.
    d. **Non-consulting services:** Other activities may be needed to support project implementation. The procurement arrangement, including service standard (timelines) and oversight arrangements, will be detailed in the procurement modules of the POM.

32. **The applicable method of procurement for each specific contract and the World Bank's review requirements (prior or post) will depend on the nature, value, and risk of each contract.** These are specified in the PP approved by the World Bank. For open national competitive procurement, the Philippines' National Procurement Procedures were assessed and found to be broadly consistent with the requirement of World Bank Procurement Regulations Section V-Paragraph 5.4 National Procurement Procedures (subject to a few conditions specified in PPSD and in the project text section of the procurement plan, and will be reflected in the bidding documents, as applicable).

33. **The PP has been prepared for the first 18 months of the project and approved during loan negotiations and published through the STEP system.** The PP will be updated annually or as required to reflect project implementation requirements and procurement risk. Contracts eligible for financing will be procured in accordance with the PP, which defines the applicable procurement methods, estimated costs, prior review requirements and time frame.

**Implementation Support Plan and Skills Mix**

34. **This national project will involve considerable pre-mission planning and logistical arrangements to be made in conjunction with the project management-NPCO or, in the case of travel to BARMM, with the PMIU of MAFAR.** Such arrangements have, however, been well established under the ongoing PRDP, where field reviews are rotated between PSO-regional clusters, usually with visits to two PSO-regional clusters per implementation support mission (ISM). Additionally, ISMs can use the virtual supervision missions developed and used effectively during the COVID-19 travel restrictions. These virtual missions are complemented through the many digital, web-based and satellite tools the DA now uses regularly to assist with subproject design, progress monitoring, O&M, and impact follow-up.

35. **Tables A1.3 and A1.4 show the skills, timing, and resource requirements for the first 12 months of the**

**project and succeeding years.** As for the ongoing PRDP, the project will require intensive levels of support throughout its implementation, particularly for reviewing larger infrastructure subproject designs and contracts and for larger enterprise business plans. Prior reviews and issuances of no-objection letters can be expected to be quite time-consuming. Introducing enhanced design standards[19] and adopting the Green Building Code[20] will also require additional inputs from engineering and safeguard specialists, at least during the first one to two years. Likewise, the support for larger enterprises will require the skills of agri-business specialists. Input from credit and insurance specialists will be necessary to strengthen private sector participation**.** Encompassing LGUs nationwide, the project's scale will also require intensive fiduciary oversight. This may increase over the project's life if counterpart funding by LGUs is increased with the roll-out of increased internal revenue allotments, in keeping with the Mandanas ruling**.** Two six-monthly full-fledged missions are planned for the first year of implementation, plus two shorter missions by a team specializing in engineering, enterprise management, safeguards, and fiduciary management. From the second year, bi-annual World Bank ISMs will be required.

**Table A1.3. Implementation Support Plan and Skills Mix (First Year)**

| Team Composition | No. of Staff Weeks | Number of Missions | Comments |
|---|---|---|---|
| Co-task team leaders (TTLs) | 20 | Four per year, including field visit | Two TTLs (one international and one national; both based in Manila) |
| Procurement specialist | 5 | Four per year, including field visits | One national staff |
| FM specialist | 5 | Four per year, including field visits | One national staff |
| Social safeguards specialists | 5 | Four per year, including field visits) | One national social safeguards specialists |
| Environmental safeguards specialist | 5 | Four per year, including field visits | One national staff |
| Agricultural, rural infrastructure, MIS/M&E, Institutional, credit and insurance specialists | 25 | Four per year, including field visit) | Four consultants with two shorter term specialist to provide credit and insurance inputs/guidance |
| Program/Team Assistant | 6 | Participate in mission (as warranted due to COVID-19) | One national staff |
| **TOTAL** | **71** | | |

**Table A1.4. Implementation Support Plan and Skills Mix (Starting Year 2)**

| Team Composition | No. of Staff Weeks | Number of Missions | Comments |
|---|---|---|---|
| Co-TTLs | 20 | Two per year, including field visit travel | Two TTLs (one international and one national; both based in Manila) |
| Procurement Specialist | 5 | Two per year, including field visit travel | One national staff |
| FM Specialist | 5 | Two per year, including field visit travel | One national staff |

[19] The I-BUILD Operations Manual will be updated to include new issuances from the Department of Public Works and Highways, National Irrigation Administration, Philippine National Standards, Bureau of Agriculture and Fisheries Standards, Philippine Agricultural and Biosystems Engineering Standards, National Building Code of the Philippines, and National Meat Inspection Code.

[20] The Green Building Code of the National Building Code (Presidential Decree No. 1096, 2015)

| Team Composition | No. of Staff Weeks | Number of Missions | Comments |
|---|---|---|---|
| Social Safeguards Specialists | 8 | Two per year, including field visit travel | Two social safeguards specialists (one national and one international staff) |
| Environmental Safeguards Specialist | 5 | Two per year, including field visit travel | One national staff |
| Agricultural, Rural Infrastructure, MIS/M&E, and Institutional Specialists | 25 | Two per year, including field visit travel | Four consultants |
| Program/Team Assistant | 6 | Participate in mission, as appropriate | One national staff |
| **TOTAL** | **74** | | |

## ANNEX 2: Clustering and Marketing; Design and Implementation Aspects

1. **The food service industry in the Philippines is growing. Consumers increasingly use online marketing platforms, which can connect them with farmers.** Consumers are beginning to shift from traditional outlets, i.e, wet markets and traditional stores to food retail markets, such as supermarkets and convenience stores. In 2017, the top three retailers—SM Investment Corporations, Pure Gold and Robinsons Retail —together owned 191 hypermarkets, 288 supermarkets, and more than 700 convenience stores, with a total turnover of US$9.9 billion (Netherlands Enterprise Agency 2017). Dedicated online marketing platforms directly connect farmers to consumers, including E-Kadiwa launched by the DA, and Deliver-e, launched by the DA, DTI, private sector partners, and USAID. Before the pandemic, the food service industry was growing by 8 percent a year, with total sales increasing from US$10.88 billion in 2015 to US$14.91 billion in 2019. This has been fueled by consumers' stronger purchasing power, the multiplication of shopping malls in Metro Manila and cities throughout the country, and an increased preference to dine out, particularly among the millennials, who comprise one-third of the country's population and are recognized as the biggest spenders (USDA 2019b).

2. **While modern markets offer increased commercial opportunities for agri-fishery production, small-scale producers are constrained by their lack of organization and limited access to technologies, services, and financing.** While corporate buyers increasingly source directly from small farmers and sometimes extend technology, this is still in its relative infancy. Private sector investment and formal credit access remain constrained by the risks and costs of sourcing from multiple, small-scale, low-technology, individual producers. Box A2.1. presents examples of these evolving markets.

**Box A2.1. Evolving Market Trends and Opportunities**

Dizon Farms is a local consolidator of fresh fruits and vegetables that directly purchases from growers in Luzon, Visayas, and Mindanao to supply 167 supermarkets across the country. The company provides quality control, storage facilities, transport, and periodic farmer training to ensure retail-level quality (JICA 2019). East West Seed Philippines sells vegetable seeds and contracts their seed production from cooperatives in Northern Luzon and Region 12, which the company trained and helped organize. Another example is Kennemer Foods International, a Philippine agribusiness company specializing in the growing, sourcing, and trading of cacao and other high-quality crops. Starting with 200 farmers in 2012, Kennemer has engaged with more than 19,000 farmers[21]. The company provides them with financing, high-quality farm inputs, technology transfer, and ongoing support via a network of trained field supervisors and farmer entrepreneurs. Kennemer is a member of the Philippines Partnership for Sustainable Agriculture (PPSA), a multi-stakeholder platform launched by the DA in 2015 in partnership with Grow Asia22. PPSA brings together global and local companies with government departments, farmers' organizations, civil society and financing institutions. It promotes initiatives that empower smallholders and facilitate their inclusion in value chains. Partnerships between smallholders and the private sector are also supported by the Department of Agrarian Reform (LinksFarm and Shared Service Facilities), the DTI, and several development partners, including IFAD (Rural Agro-enterprise Partnerships for Inclusive Development and Growth Project), GIZ, and USAID (COMPETE and GROW-Coop).

[21] See *https://www.inclusivebusiness.net/impact-story/kennemer-foods-international*, updated December 2021.
[22] Grow Asia is a partnership platform initiated by the World Economic Forum and the ASEAN Secretariat.

3. **To empower farmers and fisherfolk to achieve economies of scale and increased bargaining power in establishing product prices, the DA has embarked on a DA-wide initiative since 2022 to cluster producers through its F2C2 program.** While over 700 clusters have been initiated since the initiative was launched, the Philippines already had a long history of clustering. Numerous case studies developed over the years provide a solid body of experience on the benefits of clustering and the difficulties in sustaining viable clusters. A review of case studies was undertaken as part of project preparation (Lantican 2022), and this has been further complemented by the F2C2 review of its clustering experiences[23]. Collectively, these studies have looked at savings opportunities through postharvest loss reductions, benefits from clustering in terms of farmers' profitability, and mechanisms for expanding market opportunities and linkages.

4. **Virtually all case studies reviewed have highlighted the opportunities for raising profitability and improving food supplies through reductions in postharvest losses.** Substantial losses occur across all perishable commodities ranging from 0 to 60 percent by the time the product reaches the final consumer. For example, estimates of onion postharvest losses from the 2022 harvest cycle were around 100,000 tons[24]. As the examples below demonstrate, such losses can be reduced through better on-farm harvesting, grading, drying, storage, and crating, more efficient transport arrangements and logistics, cool storage, etc.:
    a. Mangos produced in Iloilo and traded in Manila had postharvest losses of almost 34 percent, with similar losses also experienced even closer to Manila. By comparison, mangos from a corporation following good agricultural and postharvest handling practices in the more distant Guimaras Island had losses of only 11 percent when shipping fruit to Manila.
    b. Despite their relative proximity, red onions from a major growing area in Bongabon, Nueva Ecija, were found to have a 45 percent postharvest loss before reaching Manila markets. Traders/wholesalers report additional losses of up to 36 percent from unsaleable, misshapen, bruised, damaged, or diseased products due to poor on-farm grading and handling.
    c. Tomato losses coming to Manila from nearby Nueva Ecija ranged around 11 percent. In contrast, losses of 24 percent occur when inter-island transport is involved, e.g., when coming from the large upland agricultural areas of Bukidnon, Mindanao.

5. **In the absence of clustering, producers largely depend on individual traders, most of whom have established local outlets in municipal trading centers and cities.** Many of the country's producers have long-standing arrangements with traders who buy at the farm gate. They provide a measure of assurance for producers that their products will find a market, albeit at a price dictated by the trader. Farm-gate prices are, however, quite low and often discounted due to high moisture content or other conditions set by the trader. On the other hand, traders often advance payments for products, enabling farmers to pay harvesting costs. They may also provide production inputs. For example, in the case of mangos, traders often provide funding for production, spraying, harvesting, and transport. Such trader-producer arrangements are well enshrined in Philippine agri-fishery sector.

6. **For clustering to achieve its goals of economies of scale, sustainability, and improved product quality, it must be supported by technical services and finance that at least match those provided by traders. Importantly, as the case studies below also reflect, processes to reduce postharvest losses and improve**

[23] F2C2: A strategy for Sustained Rural Development: Success stories of various cooperatives and associations (2022), Department of Agriculture, Philippines.
[24] Department of Agriculture 2023.

**product quality and shelf-life must begin at the farm level.** Clusters like those promoted through F2C2 can be defined as a geographical concentration of producers or producer organizations. These must meet minimum hectarage or other requirements defined under F2C2 and collaborate for production and marketing. Under PRDP, the clustering approach has been followed by some 70 of the enterprises supported. Those cases involved 424 cooperatives and associations, benefiting around 36,235 individual farmers/fishers. Those experiences, coupled with the review undertaken as part of PRDP Scale-Up preparation, looked at opportunities for cost-efficiency through reductions in post-harvest losses, benefits from clustering in terms of farmers' profitability, and mechanisms for expanding market opportunities and linkages. The four cases presented in Box A2.2 and summarized below provide a range of relevant lessons for designing the PRDP Scale-Up:

a. The Northern Mindanao Vegetable Producers' Association, Inc. (Normin Veggies) provides insights into the extent to which sustained technical support for farmers is essential. Key success factors were the farmers' commitment to work together; strong institutional support from the government, e.g., the DA, DTI, and the Department of Science and Technology (DOST), and other resource organizations; reliable and updated market information; good business partnerships; and professional cluster management. Box A2.2 presents the challenges, including maintaining the contracted quantity and quality of supply of agricultural products and ensuring cooperation.

b. The Contract Marketing Engagement for White Onions (Ilocos Sur Farmer Cooperative) provides an example of a different approach, but again the importance of sustained technical support. A key challenge faced by the farmer cooperative was the need to increase the number of contract growers while also securing their commitment during periods when the price of white onion in the open market was high. To avoid pole vaulting, the farmer-leader of the cooperative adopted two strategies: (a) only including only farmer-members who are committed to selling white onions to a Manila-based institutional buyer, and (b) allowing a certain portion of the marketable surplus to be sold to other buyers.

c. The Northern Foods Corporation (NFC) provides an example of difficulties encountered when government-owned and operated ventures undertake clustering and market contracts. A key challenge faced by the NFC was the need to increase the number of contract growers while securing their commitment when the prices of tomatoes in the open market were high. Under the contract, NFC advanced seeds, fertilizers, and pesticides, while the contract farmers provided the land, labor, and managed all operations. Despite these efforts, however, NFC was plagued by various issues, including a lack of pricing and cost structure transparency and payment delays (see Box A2.2).

d. The Global Organic and Wellness Corporation (GlowCorp) provides an innovative and successful social enterprise approach. Networking facilitated coordination with fragmented farmers and businesses, optimizing the cost of product consolidation. GlowCorp provided technical support to its shareholders, suppliers, and other social enterprises for market matching, quality control, product development, installation of internal control systems on organic production and certification, and packaging and labeling. This has been enhanced through digital platforms for its distribution system.

Box A2.2. Producer Clustering Case Studies: Different Approaches and Experiences

(a) **The Northern Mindanao Vegetable Producers' Association, Inc. (Normin Veggies).** This comprised individual producers, development foundations, corporate farms, farmers' associations, farmers' cooperatives, input and service providers, and institutional partners. Cluster farming was adopted to attain economies of scale, and tap better markets like institutional buyers in Manila. Previously, the main buyers of lettuce were traders at the Agora vegetable landing in Cagayan de Oro City, who offered low prices and deducted 20–30 percent for trimming (Uy, 2004). Normin Veggies operated in two clusters: (a) one (single) product and (b) a diversified product cluster. However, the one product cluster subsequently expanded from lettuce to include broccoli, cabbage, tomato, and carrot. The diversified product clusters produced assorted vegetables such as bell pepper, cabbage, eggplant, bitter gourd and tomato. Initially, the cluster had difficulties meeting quality requirements set by Manila buyers, but farmers were trained in postharvest handling. A key institutional buyer of lettuce, the Blue Dairy Corporation, a supplier of McDonalds, worked closely with the growers to improve lettuce quality by providing feedback on proper pre-cooling, sorting, trimming, packaging in plastic crates, and using refrigerated vans in shipping by RoRo. The Bukidnon lettuce cluster also received strong institutional support from government agencies, private companies, LGUs, and international organizations. The DA RFO provided training, a refrigerated van and truck, while the LGU (Impasugong) provided a plug-in facility for reefer vans and FMRs. Industry associations provided trucking services, and the FAO and USAID-GEM provided technical support. In 2003, the Northern Mindanao Vegetable Corporation (NorminCorp) was formed as its market facilitator. Key success factors (Uy 2005) were the farmers' commitment to work together; strong institutional support from the government (e.g., DA, DTI, and DOST) and other resource organizations; reliable and updated market information; good business partnerships; and professional cluster management with cost-sharing among farmers, e.g., splitting facilitation fees. However, the study also reported the issues and challenges facing FCA clusters: (a) maintaining the required quantity and quality of supply of agricultural products agreed in the contract between the committed buyer and the cluster; (b) sustaining the cooperation of all the cluster members to avoid pole-vaulting or selling the produce to other buyers; (c) sustaining financing; and (d) increasing the number of dedicated and influential FCA leaders.

(b) **The Contract Marketing Engagement for White Onions; Ilocos Sur Farmer Cooperative.** A 42-member cooperative signed a contract marketing agreement with a Manila-based institutional buyer to ensure a regular, better market outlet for white onions produced by farmer members. The contract provided that the cooperative should deliver 14,640 kilograms every two weeks at PhP31.25 per kilogram, which was 25 percent higher than the wholesale price offered by local traders. The white onions were required to meet specific quality specifications and farmer members followed a quality assurance plan. The DA provided training on good agricultural practices, including postharvest handling, in coordination with the marketing manager of the institutional buyer. The buyer deposited the payment through a designated bank one to two weeks after onion delivery. The assigned treasurer of the farmers' cooperative distributed the payment to farmer members after deducting all the costs associated with delivering the white onion and 5 percent from the total sales as their contribution to the revolving fund of the cooperative. The net returns for a one-hectare white onion farm amounted to PhP 132,501 per hectare, more than double when white onions were sold to local traders. To avoid pole-vaulting, the farmer-leader of the cooperative adopted two strategies: (a) only including farmer members who are interested and committed to selling white onions to a Manila-based institutional buyer; and (b) allowing a certain portion of the marketable surplus to be sold to other buyers.

(c) The NFC. This was established in 1984 as a government-owned and controlled corporation engaged in tomato processing. The Livelihood Corporation was a government corporation owned and controlled the NFC until the former's abolition in 2015, when the NFC became an attached agency of the DA by virtue of E.O. No. 233 in the same year. The NFC was subsequently abolished in 2021 due to: (a) non-consistency with the national development policy of the state; (b) incurred net losses since its founding except in 1989, 1995 and 2010; and (c) its engagement in activities that can be carried out by the private sector (Panti, 2021). Located in Sarrat, Ilocos Norte, NFC's plant had a processing capacity of 500 MT of fresh tomatoes per day. The plant had to utilize its full production capacity during its four-month (January–April) operation to keep prices competitive and cover operating costs. A key challenge faced by NFC was the need to increase the number of contract growers while securing their commitment during periods when the price of tomatoes in the open market was high. Under the contract, NFC advanced seeds, fertilizers, and pesticides, while the contract farmers provided the land and labor, and managed all operations. Payments of all inputs provided were deducted from the proceeds of delivery. To reinforce farmers' commitment to marketing agreements, the NFC organized their contract growers into small groups of three to five farmers to promote collective responsibility for each other's quota/commitment. Despite these efforts, however, NFC succumbed to farmers' clamor to review the buying price as they felt it was lower than the open market price. The NFC also featured a lack of transparency on pricing and cost structure; delays in payment for fresh processing tomatoes to contract growers; underutilized processing plant capacity; and antiquated processing plant and equipment. Farmers also chose to sell to the open market if the price was higher, despite the 90:10 production-sharing arrangement.

(d) The Global Organic and Wellness Corporation (GlowCorp). This company coordinated FCAs, NGOs, and private individuals through a networking approach. It facilitated coordination with fragmented farmers and businesses while optimizing the cost of product consolidation. Coordination helped ensure that the producers and consolidators strictly followed production, processing and marketing protocols to guarantee product quality. As of 2021, 12 processed product lines were handled under 14 different brand names. All products handled by GlowCorp were organically produced in keeping with its wellness campaign. Based in Cabuyao, Laguna, GlowCorp was incorporated in 2010 with an authorized capitalization of PhP 10 million. Its beginnings can be traced to the farmers' associations initially supported by the Philippine Development Assistance Program, an NGO that introduced agricultural enterprises for agrarian reform beneficiaries and small farmers. After ten years of operation, some 6,500 micro and small entrepreneurs/farmers have been assisted by connecting them to 815 outlets, with trade values amounting to PhP 372 million. GlowCorp has provided technical support to its shareholders, suppliers, and other social enterprises for market matching, quality control, product development, installation of internal control systems on organic production and certification, and packaging and labeling. This has been enhanced through digital platforms for its distribution system (Berondo 2021).

7. **Collectively, the above case studies provide important lessons on clustering for the project's design**, as summarized below:
    a. The success of clustering requires the full support, commitment, and strong partnership or collaboration between all the major actors. Where this was not sustained, the benefits from clustering were short-lived. This also highlights the need for careful selection of Implementing Proponents and regular business plan management support.
    b. Big brother and small brother (productive alliance) approaches worked best where the lead Implementing Proponent provided strong direction. In such cases, consolidation enabled a large market share to be captured, resulting in more secure and stable markets. There was also enhanced

knowledge and technology sharing among producers.

c. Members of clusters often prefer to keep some of their produce for sale to private buyers. Private traders frequently offer slightly higher prices or pre-financing to gain a purchase advantage, i.e., pole-vaulting.
d. Clustering can lead to substantial benefits for producers in terms of profitability. However, benefits are more pronounced where the lead Implementing Proponent or institutional buyer takes a direct interest in the producer and provides technical service, inputs, and feedback.

Box A2.3 summarizes more general operational lessons drawn from 23 years of operational work in the Philippines on agriculture and rural development.

**Box A2.3 Operational Lessons from Implementing Agriculture and Rural Development Projects in the Philippines**

a. PCIPs are an effective tool for improving the agri-fishery sector investment planning and budgeting between the DA and LGUs, and for leveraging resources of other government agencies and the private sector.
b. The organization of Citizen Monitoring Teams has enabled communities to gain a higher sense of ownership of subprojects in their localities, and this has contributed to improving the quality of subprojects and their sustainability.
c. The preferred stakeholder method of recording grievances and concerns is through manual and face-to-face systems, although this is also facilitated through web-based systems.
d. Joint technical reviews by all concerned parties (the NPCO, PSO, and RPCO) have proven to be an effective means to streamline/expedite the subprojects' review and approval process.
e. Sustained technical/managerial technical assistance and follow-up is needed to ensure the sustainability of newly established enterprises, for which the engagement of DA and other government and industry experts is critical.
f. More intensive technical support and follow-up is needed at the farm level to improve production and harvesting practices and enhance produce quality.
g. Cost-sharing arrangements between the DA and LGUs for enterprise support must be streamlined, especially given LGUs' preference for more visible and high-demand infrastructure investments, particularly FMRs.
h. Mainstreaming the Infrastructure Quality Monitoring and Durability System at the DA is an effective tool for improving the quality of roads through enhanced supervision and monitoring.
i. O&M by LGUs has been significantly improved through IMAs and by linking further funding support to O&M performance.
j. The involvement of communities in monitoring the implementation and O&M of subprojects encourages increased ownership of infrastructure projects.
k. A first-come-first-served approach for eligible beneficiaries facilitates subproject start-up and learning-by-doing, with prioritization possible later in implementation.
l. Significant opportunities and innovation can be achieved through having an in-house capability in geospatial and other digital technologies; under PRDP, innovations far exceeded what was envisioned at appraisal through this in-house capacity[25].

[25] Digital tools developed under PRDP include the expanded Vulnerability and Suitability Assessment (*e*VSA), the Planners' Portal, the LGU Module Tracking System for tracking PCIP funding by PRDP and non-PRDP sources, the I-BUILD portal, the Enterprise Developers'

m. There is significant potential for developing partnerships between FCAs and corporate buyers[26], facilitated by the provision of subgrants for infrastructure and equipment. This enables the development of larger volumes of better quality produce that meets market requirements, technical and management support for increased FCA efficiency and sustainability, and fosters mutual trust.
n. Ready access to financing through formal channels is constrained by the lack of farmers' information on financial services, their inability to meet banks' eligibility requirements, and the lack of appetite of financial institutions to lend to smallholders[27].
o. Investment in infrastructure and equipment needs to be complemented by skills development to build sustainable enterprises, particularly with regard to clustering and organization, business management and marketing

Portal, web-based M&E, geotagging, geomapping dashboards, and UAV/drone utilization, virtual platforms as an alternative mode for field visits, data gathering and feedback, the Individual Performance Evaluation Profile-Accomplishment Reporting System (iPEP-ARS), and a range of on-line tools for tracking and expediting document processing.

[26] As demonstrated by 372 out of the 449 productive subprojects in operation having marketing agreements (or 83 percent percent) with 633 institutional buyers. Productive subprojects are projects with marketable output, which is not the case of another 184 micro rehabilitation projects that consisted of tractor services.

[27] As shown by the fact that only 134 of the total 999 PRDP-supported PGs (or 13 percent) have been taking loans. A survey is being conducted to clarify the reasons and factors for such a limited result. The survey report is expected before the PRDP Scale-Up's final design.

## ANNEX 3: Economic and Financial Analysis

1. **This EFA draw on data from a wide range of reputable sources.** It is based on discussions and agreements with the government, desktop research, data drawn from published agriculture statistics, PRDP's management information system and impact assessments, and lessons learned from project implementation, supplemented by the DA's national planning strategies and directional plans. The relevant subprojects in PRDP's I-BUILD and I-REAP pipeline portfolio were used as references in the modeling. The results should be strictly considered as ex-ante outcomes. The selected interventions (Table A3.1) are representative of eligible subprojects during project implementation. Figure A3.1 presents the analytical framework of the PRDP Scale-Up EFA.

2. **The analysis focuses on infrastructure and enterprise development investments of the PRDP Scale-Up that aim to spark sectoral transformation through value chain development and strengthened supply chain logistics and connectivity.** The EFA modeled representative subproject interventions that will support key agricultural commodities identified in the NAFMIP and address the gaps and bottlenecks identified in their respective VCAs. The project is expected to expand its impacts and benefits by operationalizing an improved strategic planning framework emphasizing support for multi-commodity interventions with a regional agriculture development perspective.

3. **The infrastructure investments include the construction of: (a) FMR with bridges; (b) small-scale irrigation projects (SSIP); (c) potable water systems (PWS); (d) agriculture tramline systems; and (e) and value chain support infrastructure such as slaughterhouses, fish landings and feeder ports.** These infrastructure subprojects aim to supplement and spur the adoption of innovative agricultural practices and enterprise activities of farmers and fisherfolk clusters and associations. The analysis modeled twelve enterprise models for the enterprise subgrants, which adopt clustering and consolidation strategies to cater to a wide array of commodities and beneficiaries (Table A3.1). These models are based on PRDP enterprise subprojects and focus on big-ticket subproject interventions that provide common service facilities and support for agri-fishery producer clustering, modernized agriculture production at scale, and product consolidation/integration.

**Table A3.1. Matrix of Proposed PRDP Scale-Up Interventions for the EFA**

| Type of Subproject | Brief Description/Rationale | Expected Impact |
|---|---|---|
| ***I.*** Infrastructure | | |
| 1. Farm-to-Market Road with Bridge | Construction and/or rehabilitation of two-lane and other access roads and the construction of two-lane reinforced concrete or steel bridge connecting the production areas to market centers to facilitate and improve efficiency in the flow of products, goods, and services and ensure linkage to markets. | • Improved connectivity and flow of products, goods, and services; and linkage to markets ensured.<br>• Reduced hauling (input/output) costs<br>• Increased marketable outputs (reduced transportation losses)<br>• Reduced travel time |
| 2. Irrigation | Construction of small-scale irrigation projects such as solar power pump irrigation systems to improve agricultural production and productivity through better water management and water availability. | • Improved productivity<br>• Increase in cropping intensity<br>• Increase in yield |
| 3. Potable Water System | Construction or rehabilitation of Level 2 potable water systems. This aims to promote better community health by reducing the incidence of water-borne diseases. | • Reduced incidence of water-borne diseases.<br>• Improved capacity to |

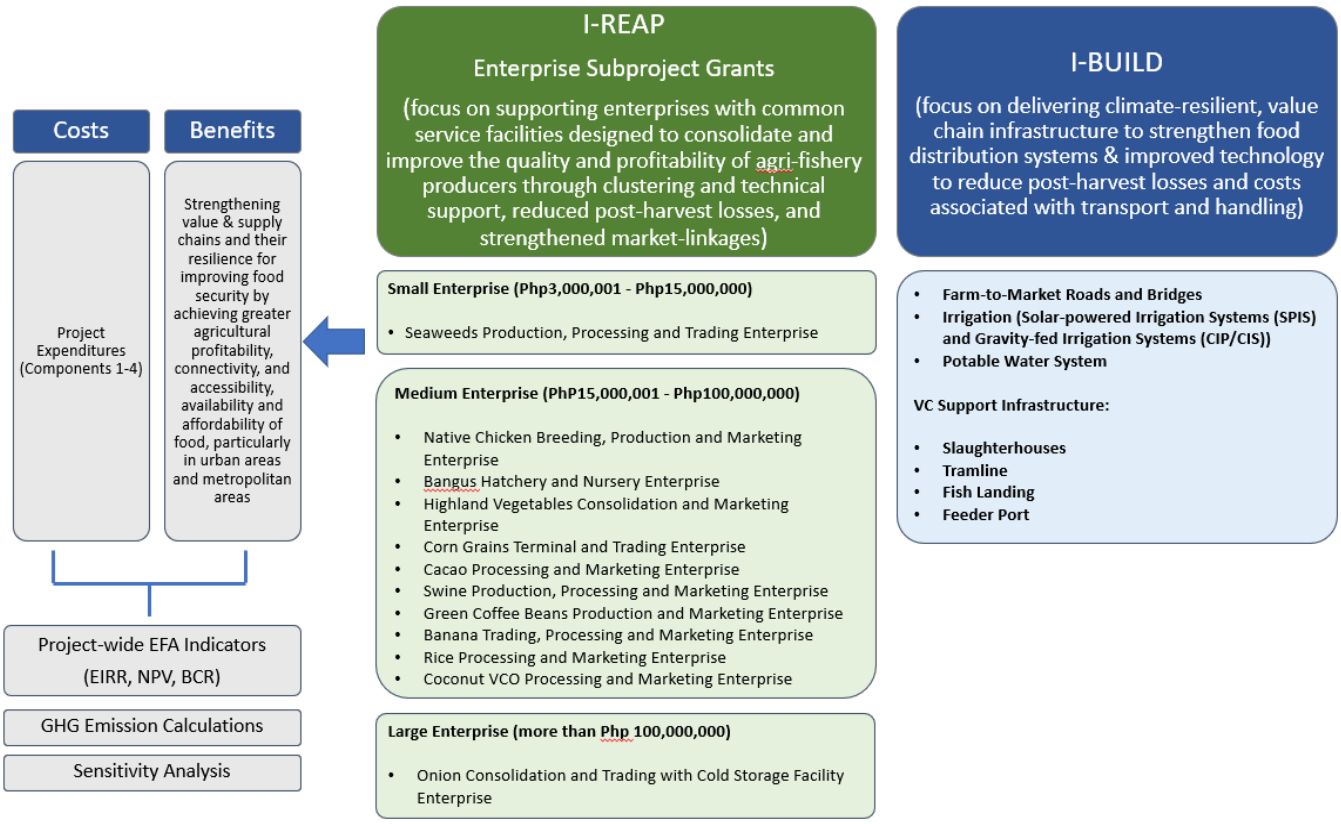
| Type of Subproject | Brief Description/Rationale | Expected Impact |
|---|---|---|
| | | undertake additional economic activities<br>• Reduction in medical expenses<br>• Reduction in morbidity and mortality incidence<br>• Time savings from water fetching<br>• Savings in water expenses<br>• |
| 4. Tramline | Intended for mountainous areas of the country, such as the Cordillera Administrative Region and Region 2, to facilitate the hauling of agricultural products. This will help address the high cost of hauling and transportation losses. This involves the construction of new or rehabilitation of existing agriculture tramline systems. | • Improved accessibility to the greater community and market access.<br>• Reduced hauling (input/output) costs; and<br>• Increased marketable outputs (reduced transportation losses) |
| 5. Fish Landing | Establishing fish landing subprojects that support widely dispersed fishing areas in the country requiring strategic landing centers. This will enable the immediate selling, storage, processing, or shipping of fish products to the markets to continuously respond to the sector's requirements. | • Improved efficiency in handling, marketing, and distribution of fish and fishery products<br>• Increased marketable outputs (reduced postharvest losses, increased volume transported)<br>• Increased market value (output price) |
| 6. Feeder Port | Support to inter-island trading of commodities through lower transport costs, reduced travel time and reduced transport losses. In this model, several commodities (coconut, banana, coffee and swine) are linked to reach external markets. The feeder port will result in increased market value and farmers' income. | • Improved market accessibility<br>• Increased value of marketable outputs (reduced transport cost and losses) |
| 7. Slaughterhouse | These aim to address constraints in the value chain of cattle and swine, such as the high cost of slaughter fees and improper handling resulting in reduced meat quality. | • Increased marketing value<br>• Lower slaughter fee, meaning higher income for farmers |
| ***II.*** Enterprises | | |
| 1. Seaweed Production, Processing and Trading | The enterprise will support seaweed production, processing/postharvest, and marketing activities. It will help address the constraints on inadequate supply of good quality seedlings, lack of capital and access to financial resources, limited drying and storage facility, and inconsistent quality of raw dried seaweed as identified in the VCA of Seaweeds.<br><br>The Seaweed Enterprise Model will increase the production volume of raw dried seaweed by providing production and postharvest support. The project will also contribute to improving the income of farmer beneficiaries through an increase in the volume of marketable output. Additionally, the patronage refund that will be distributed will supplement the beneficiaries' income. The enterprise business model will generate employment for at least 24 staff. | • Increased production volume of raw dried seaweed<br>• Increased income of seaweed farmer beneficiaries |

| Type of Subproject | Brief Description/Rationale | Expected Impact |
|---|---|---|
| 2. Native Chicken Breeding, Production and Marketing | The enterprise model for native chickens will engage in breeding, fattening, and marketing activities. It will help address value chain constraints such as limited breeding centers and unorganized native chicken growers.<br><br>The enterprise is expected to contribute to increasing the supply of quality native chicken through breeding activities. It will also increase the income of farmer member beneficiaries through a 15 percent share of the enterprise's net income. Moreover, the jobs to be generated by the enterprise will contribute to the increase in income of the beneficiaries. Thirteen job positions will be required to manage and operate the enterprise. | • Increased volume of production of native chicken<br>• Increased income of native chicken farmer beneficiaries |
| 3. Bangus Hatchery and Nursery | The enterprise will operate three major facilities: brood stock, hatchery, and nursery. It will address the main constraints in the value chain relating to the lack of access to breeders and inadequate postharvest facilities and technologies at the farm/community level. The enterprise aims to increase the domestic production of milkfish eggs and fry. | • Increased net income of farmers from savings in the cost of pond preparation and dike improvement<br>• Lowered price of bangus (milk fish) fingerlings for the bangus producers<br>• Improved quality of bangus fingerling resulting in a higher survival rate |
| 4. Highland Vegetables Consolidation and Marketing | The enterprise subproject will support the postharvest handling of highland vegetables such as cabbage, carrots, potatoes, broccoli, bell pepper, baguio beans, cauliflower and lettuce. To ensure that the quality of vegetables is maintained during hauling and delivery, it will procure a utility van and a chiller van.<br><br>The enterprise will support the development and strengthening of farmer groups' capacities to collaborate, coordinate and consolidate their activities to achieve economies of scale in production and to become reliable partners to larger institutional buyers and access wider markets. | • Reduced hauling costs<br>• Increased farmer incomes |
| 5. Corn Grains Terminal and Trading | The enterprise will consolidate corn production for processing into hog and poultry feeds. Corn will be sourced from different provinces, where cooperative members will receive a premium price. The enterprise will address value chain constraints relating to the limited value-adding activities and inadequate funding/capital for advanced postharvest facilities.<br><br>The enterprise will ensure market availability for corn farmers of cluster groups/members while providing them with premium buying prices. It will also contribute to the growing demand for corn for mixed feeds. | • Reduced postharvest losses and increased market availability for corn farmers<br>• Increased market value for corn<br>• Increased income of hog and poultry growers due to an adequate supply of quality feeds |
| 6. Cacao Processing and Marketing | The enterprise will focus on value-adding activities and creating economies of scale by adopting the clustering approach. The subproject addresses constraints in cacao's VCA relating to the limited number of cacao consolidators, the lack of business and marketing skills of associations engaged in the distribution of tablea and powder, and the weak relationship between the processors and individual farmers and traders, which affects the regularity of supply. | • Increased income of cacao farmer beneficiaries<br>• Improved marketable outputs |

| Type of Subproject | Brief Description/Rationale | Expected Impact |
|---|---|---|
| | The enterprise will provide a market for the dried fermented cacao beans of the cluster groups. This will increase the beneficiaries' income through increased marketable outputs and a patronage refund that will be distributed to members out of the enterprise's net income. In addition, the proposed enterprise will provide employment opportunities. | |
| 7. Swine Production, Processing and Marketing | The enterprise will engage in swine breeding, hog fattening, and meat processing. The high cost of inputs and genetics stocks, limited supply and lack of postharvest facilities for meat processing, and lack of marketing equipment/facilities are the main constraints identified in the VCA of swine, which the enterprise aims to address.<br><br>The enterprise will increase local swine production by engaging in breeding activities to improve the availability and quality of hogs and meat products supplied in the market. Incomes of member beneficiaries will be supplemented by the subproject's enterprising activities (i.e, lower production costs and higher marketable output) and the enterprise's net income dividends. Employment generation of the project includes the 16-manpower requirement for the breeding station, meat shop, and administrative and marketing activities. | • Increased volume of production of swine<br>• Increased income of swine farmer beneficiaries |
| 8. Green Coffee Beans Production and Marketing | The enterprise will process the fresh berries of farmers into green coffee beans with a PhP 25 processing fee.<br><br>By establishing facilities in strategic locations for postharvest processing (depulping, drying, dehulling), the enterprise will address key value chain constraints such as the lack of accessible postharvest facilities and machinery. | • Increased efficiency of postharvest facility<br>• Reduced postharvest losses<br>• Increased value of marketable output and increased income of coffee growers |
| 9. Banana Trading, Processing and Marketing | The enterprise will focus on postharvest and marketing activities. It will procure a hauling and delivery vehicle to reduce the high cost of hauling while ensuring the quality of the transported banana.<br><br>The enterprise will address key constraints in the value chain, such as high cost of hauling fees due to insufficient harvest and postharvest facilities, bananas' perishability, low volume of processed bananas for distribution, lack of capital for banana processing, limited processing facilities and equipment, and establishment and strengthening of cooperatives to operate enterprises engaged in buying, processing and trading of banana. | • Increased market value of banana<br>• Market accessibility for banana farmers<br>• Reduce postharvest losses |
| 10. Rice Processing and Marketing | The business model for the aromatic and pigmented rice enterprise focuses on addressing the following constraints in the Rice VCA:<br>• *Postharvest/consolidation segment:* Limited drying and storage facilities resulting in low quality and low price for fresh paddy, high postharvest losses, and high drying and storage cost.<br>• *Processing segment:* High milling cost and insufficient modern milling, mechanical drying, weighing and storage facilities, and high capital requirements.<br>• *Production segment:* Lack of farm mechanization support. | • Increased efficiency of drying and milling<br>• Reduced postharvest losses<br>• Increased milling recovery<br>• Increased value of marketable output and increased income of rice farmer beneficiaries |

| Type of Subproject | Brief Description/Rationale | Expected Impact |
|---|---|---|
| | The enterprise will help increase the efficiency of drying and milling fresh palay by reducing postharvest losses and increasing milling recovery. This will lead to an increased value of marketable output, which will translate to an increase in the enterprise's income. By extension, the enterprise will contribute to increasing the incomes of farmer beneficiaries through the premium price of PhP1.00 per kilogram for selling their fresh palay to the enterprise. Dividends out of the enterprise's net income are distributed to members. Additionally, they receive a reduced rental fee for tractors during land preparation.<br><br>The enterprise is estimated to generate 21 jobs covering administration, O&M of the rice mill and dryer, and marketing operations. Seasonal laborers will also be hired to haul, load, and unload palay from the farm to the rice mill facility. | |
| 11. Coconut Processing and Marketing | This enterprise will process coconuts into two product forms: virgin coconut oil and coconut water. It will source its coconut from clustered coconut farmers.<br><br>The enterprise will address key constraints in the value chain by consolidating/clustering coconut farms and through institutional upgrading through production expansion by improving farmers' production capacities. The subproject is also expected to generate employment for 84 people for its whole operation. | • Ensured market availability<br>• Increased market value due to premium price<br>• Increase in farmers' income |
| 12. Onion Consolidation and Trading with Cold Storage Facility | The enterprise will help address key constraints identified in the VCA of onion, such as the lack of access to storage and postharvest facilities and market outlets or trading centers contributing to local price volatility.<br><br>The enterprise will provide beneficiaries with increased marketable output value and income. The presence of the cold storage facility will lead to a higher selling price when trading during the lean season. Based on the national average selling price of onion, the increase in price during the lean season can go as high as 133 percent (PSA data, 2021). Subsequently, the income could increase up to 97 percent after deducting the rental fee for using the cold storage facility. Farmers already using storage services outside of the project will benefit from reduced rental fees since the subproject will offer a fee lower than the prevailing rates of private-owned facilities. Additionally, farmer members will receive dividends and patronage refunds. The project will generate employment opportunities for 14 employees and 23 laborers during the onion procurement and trading season. | • Increased value of marketable output<br>• Increased income of onion farmer beneficiaries |

**Figure A3.1. Analytical Framework of the PRDP Scale-Up EFA**




**Box A3.1. EFA Methodology and Assumptions**

1. This EFA uses a classic BCA framework.
   a. The analysis period used to calculate the project's viability and sustainability measures was 20 years. The analysis assumed a project duration of five years (2024-2028), as per the expected loan disbursement. The 20-year timeframe for the analysis seems appropriate, given the duration of the project and the nature of the infrastructure subprojects with long construction time and estimated useful economic life.
   b. Most of the assumptions used in the analysis were based on the consolidated database of approved PRDP subprojects for I-BUILD and I-REAP. Other assumptions, such as production area, volume, prices, and wage rates, were based on published data from the Philippine Statistics Authority (PSA) and the Department of Labor and Employment.
   c. The detailed modeling assumptions used in estimating the standard measures of feasibility/profitability for each infrastructure and enterprise subproject are presented in the EFA worksheet.
   d. Several macroeconomic variables were assumed for this analysis. The domestic inflation rate was assumed to be 3.90 percent, which was the 5-year inflation rate average as of Nov 2022 based on the PSA. The real exchange rate of the Philippine peso (PhP) to the U.S. dollar (US$) was kept at PhP55 = US$1. The financial discount rate used the computed weighted average cost of capital of 6.94 percent, while the economic discount rate used the social discount rate of 10 percent. The foreign exchange premium was calculated and established at 20 percent. The value added tax was assumed to remain at its current level of 12 percent. Transportation costs (port–market and market–port) were assumed at 5 percent, as were port handling costs.
2. The first step of the analysis was constructing financial cash flows for enterprise interventions. These cash flows include all potential costs and revenues that will accrue to establish and sustain the enterprise interventions as specified in Table A3.1. Based on these cash flows, standard measures of the project's financial profitability and sustainability were estimated for each

enterprise and the overall project: financial net present value (FNPV), financial internal rate of return (FIRR), and BCR.

3. In the second step of the analysis, all financial cash flows were adjusted to their economic values using a set of self-calculated conversion factors. The economic flows of resources—economic net present value (ENPV), EIRR, and BCR—were estimated to reveal the economic profitability of the proposed enterprises.
4. The third step was constructing financial and economic cash flows for the infrastructure interventions listed in Table A3.1. These streams reflect the required investments to construct public good infrastructure that will produce substantial economic benefits through increased capacities and opportunities for farmer and fisherfolk cooperatives and associations to engage in value-chain activities.
5. The fourth step was to do an ex-ante quantification of GHG emissions to estimate the impact of agricultural investment on GHG emissions and carbon sequestration using the Ex-Ante Carbon balance tool (EX-ACT) developed by the FAO.
6. The fifth step was to combine the economic benefit and cost flows to develop standard measures of the project's economic viability: ENPV, EIRR, and BCR. The economic flows include the costing of greenhouse gas (GHG) emissions to account for environmental impacts.
7. The final step of the analysis was a sensitivity analysis. Several "what-if" scenarios were analyzed to see how the ENPV, EIRR, and BCR might be influenced if some important variables change.

4. **The results of the EFA show that PRDP Scale-Up is expected to produce substantial economic benefits by increasing capacities and opportunities for farmer and fisherfolk cooperatives and associations to engage in value chain activities and empowering the sector to achieve agri-food system resiliency.** Calculated over 20 years, the results indicate that all proposed intervention scenarios will have positive incremental economic benefits (Table A3.2). The project EIRR is 29.41 percent, which is above the economic discount rate set at 10 percent (equal to the Philippine economic opportunity cost of capital). The BCR is 1.74, and the ENPV is estimated at PhP56.72 billion (US$1.03 billion). At the enterprise level, the financial measures of profitability are positive for all the enterprise interventions, indicating that rural agri-fishery cluster enterprises are worthwhile investments. The financial analysis suggests that sustainability is likely, as financial profitability measures (FNPV, FIRR, and BCR) are positive.

5. **The economic analysis incorporates the impact of GHG emissions under low and high carbon shadow prices, following the World Bank's 2017 guidelines**. With the infrastructure and enterprise interventions of the project, the total net carbon balance will reach an estimated average of +25,727 $tCO_2eq$ emissions per year, corresponding to an estimated total of +514,543 $tCO_2eq$ emitted over the entire project life. Using estimates for low and high carbon prices equal to US$44 and US$87, respectively, the project remains feasible with the analysis yielding a 29.19 percent EIRR, a US$1.02 billion NPV and a 1.73 BCR for the low estimate and a 28.98 percent EIRR, a US$1.01 billion NPV and a 1.72 BCR for the high estimate.

6. **The sensitivity analyses for both lower-bound and upper-bound carbon prices show that the EFA results are robust under more challenging conditions: (a) increased costs; (b) reduced benefits, and (c) delayed benefits.** Several "what-if scenarios" were created to consider changes of up to +/-30 percent in each variable. The analysis shows the project's robust viability, with the EIRR remaining above the social discount rate of 10 percent. The incremental ENPV remained positive, and the EIRR remained above the economic discount rate of 10 percent when costs increase by 30 percent, benefits decrease by 30 percent, or if benefits are delayed by two years (Tables A3.2 and A3.3). These results further suggest that economic profitability measures (ENPV, EIRR, BCR) are solid.

**Table A3.2. EFA Indicators for Base Scenario without Costs of Carbon, at 10 Percent SDR**

| | IRR (%) | NPV at 10 % (PhP billions) | BCR |
|---|---|---|---|
| **Base scenario** | **29.41** | **56.72** | **1.74** |

Note: SDR = Special drawing rights

**Table A3.3. Sensitivity Analysis at Lower Bound Carbon Price (US$44/tCO$_2$) at 10 Percent SDR**

| | IRR | NPV at 10 % (PhP billions) | BCR |
|---|---|---|---|
| **Base Scenario** | **29.19** | **56.11** | **1.73** |
| **Sensitivity Scenarios** | | | |
| 5 % Cost Increase | 27.25 | 52.26 | 1.65 |
| 10 % Cost Increase | 25.46 | 48.41 | 1.57 |
| 15 % Cost Increase | 23.80 | 44.56 | 1.50 |
| 20 % Cost Increase | 22.25 | 40.71 | 1.44 |
| 30 % Cost Increase | 19.43 | 33.01 | 1.33 |
| 5 % Benefits Decrease | 27.16 | 49.45 | 1.64 |
| 10 % Benefits Decrease | 25.08 | 42.80 | 1.56 |
| 15 % Benefits Decrease | 22.97 | 36.14 | 1.47 |
| 20 % Benefits Decrease | 20.80 | 29.48 | 1.38 |
| 30 % Benefits Decrease | 16.24 | 16.17 | 1.21 |
| 1-Year Delay of Benefits | 21.32 | 39.67 | 1.52 |
| 2-Year Delay of Benefits | 16.49 | 25.04 | 1.33 |
| Cost Increase + Benefits Decrease + 1 Year Delay of Benefits | | | |
| 5 % | 18.62 | 30.17 | 1.37 |
| 10 % | 15.86 | 20.48 | 1.24 |
| 15 % | 13.11 | 10.78 | 1.12 |
| 20 % | 10.32 | 1.09 | 1.01 |
| Cost Increase + Benefits Decrease + 2 Years Delay of Benefits | | | |
| 5 % | 14.19 | 16.08 | 1.20 |
| 10 % | 11.88 | 7.13 | 1.08 |
| 15 % | 9.51 | -1.81 | 0.98 |
| 20 % | 7.05 | -10.77 | 0.88 |

Note: SDR = Special drawing rights

**Table A3.4. Sensitivity Analysis at Upper Bound Carbon Price (US$87/tCO$_2$) at 10 Percent SDR**

| | IRR (%) | NPV at 10 % (PhP billions) | BCR |
|---|---|---|---|
| **Base Scenario** | **28.98** | **55.50** | **1.72** |
| **Sensitivity Scenarios** | | | |
| 5 % Cost Increase | 27.04 | 51.62 | 1.63 |
| 10 % Cost Increase | 25.25 | 47.74 | 1.56 |
| 15 % Cost Increase | 23.59 | 43.86 | 1.49 |
| 20 % Cost Increase | 22.04 | 39.98 | 1.43 |
| 30 % Cost Increase | 19.21 | 32.21 | 1.32 |
| 5 % Benefits Decrease | 26.94 | 48.84 | 1.63 |
| 10 % Benefits Decrease | 24.87 | 42.19 | 1.54 |
| 15 % Benefits Decrease | 22.75 | 35.53 | 1.46 |
| 20 % Benefits Decrease | 20.58 | 28.87 | 1.37 |
| 30 % Benefits Decrease | 16.01 | 15.56 | 1.20 |
| 1-Year Delay of Benefits | 21.14 | 39.06 | 1.50 |
| 2-Year Delay of Benefits | 16.33 | 24.43 | 1.31 |
| Cost Increase + Benefits Decrease + 1 Year Delay of Benefits | | | |
| 5 % | 18.44 | 29.53 | 1.36 |

| | IRR (%) | NPV at 10 % (PhP billions) | BCR |
|---|---|---|---|
| 10 % | 15.68 | 19.81 | 1.23 |
| 15 % | 12.92 | 10.08 | 1.11 |
| 20 % | 10.11 | 0.36 | 1.00 |
| Cost Increase + Benefits Decrease + 2 Years Delay of Benefits | | | |
| 5 % | 14.03 | 15.44 | 1.19 |
| 10 % | 11.70 | 6.46 | 1.08 |
| 15 % | 9.32 | -2.51 | 0.97 |
| 20 % | 6.84 | -11.50 | 0.88 |

Note: SDR = Special drawing rights

7. **Overall, the EFA results confirm that the agri-fishery sector will benefit financially and economically from the proposed infrastructure and enterprise interventions of the PRDP Scale-Up.** The main impacts will manifest through higher incomes, the improved value of marketable outputs, strengthened food distribution systems, and reduced postharvest losses and transportation costs. Over the medium to long term, the prospective agri-fisheries interventions will spark sectoral transformation to realize economies of scale.

## ANNEX 4: GHG Accounting and Climate Co-Benefits

### Part A: GHG Accounting

1. **The project development objective of the PRDP is "to improve farmers' and fisherfolk access to markets and profitability in selected value chains".** The project is national in scope and has four components: (a) local and national-level planning (I-PLAN); (b) rural infrastructure market linkage (I-BUILD); (c) enterprise development (I-REAP); and (d) project management (I-SUPPORT).

2. The ex-ante quantification of GHG emission reductions is an important step in managing and ultimately reducing GHG emissions. To estimate the impact of agricultural investment on GHG emissions and carbon sequestration, the World Bank has adopted the Ex-Ante Carbon balance tool (EX-ACT), developed by the FAO in 2014. EX-ACT allows the assessment of the project's net carbon balance, defined as the net balance of $CO_2$ equivalent GHG emitted or sequestered because of project implementation compared to a without-project scenario, assumed to be the adoption of conventional technologies. EX-ACT estimates the carbon stock changes (emissions or sinks), expressed in equivalent tons of $CO_2$ per hectare and year. Three gases are considered in the calculations: carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$). The latest available global warming potential is used to convert all emissions into $CO_2$ equivalent: 273 for $N_2O$ and 27.2 for $CH_4$.

3. **The project will be implemented over five years (2024–2028).** The analysis is run over 20 years, with a capitalization phase of 15 years. Tropical wet climate and high-activity clay soils were assumed to be representative of the Philippines.

4. **The project interventions and the with-and-without scenarios developed for the EFA were used for GHG accounting.** Several of the assumptions and figures from the EFA were also inputs to this GHG analysis and come from updated data from the DA's experiences in implementing the ongoing PRDP. The results from this analysis should be considered strictly ex-ante outcomes. The lack of details for many of the proposed interventions led to assumptions that may not be accurate once each subproject is projected. As such, it is suggested to update the GHG accounting once the feasibility studies for all interventions are available to reflect the actual emissions or conduct an ex-post quantification during project review. The without-project scenario for the analysis corresponds to the current baseline situation.

5. **The GHG analysis was carried out for every single intervention and then aggregated. The analysis focuses on the infrastructure and enterprise development investments of the PRDP Scale-Up, as modeled in the EFA.** The assumptions for the individual interventions are described below:

#### *I.* Infrastructure

**I.A.** FMR: The project will construct 1,174 km of concrete roads: 822 km of new FMRs and 352 km of rehabilitated ones. It is assumed that these FMRs are bendy and gently undulating secondary roads, and their overall road conditions will be upgraded from poor to good quality. Using the HDM-4 road model, an average reduction of 11 percent in fuel use is expected with the project. Without the project, more fuel will be consumed for transportation. However, there is also an anticipated 15 percent increase in traffic. This will result in extra consumption of 1 $m^3$ of fuel per year while reducing hauling costs, travel time, and vehicle maintenance. For road construction, 442,814 $tCO_2eq$ will be emitted during construction and 48 $tCO_2eq$ per year from the extra fuel. Reduction in transport losses is among the benefits but not counted in EX-ACT.

**I.B.** Bridges: It is assumed that a total of 1,962 meters of reinforced concrete bridges will be constructed. A total of 1,012 $tCO_2eq$ are expected to be emitted during their construction.

**I.C.** Irrigation systems: A total of 2,518 ha will be equipped with small-scale irrigation systems. It will allow the irrigating of carrots, potato, and cabbage fields by installing a gravity-fed (1,778 ha) and a solar-powered (740 ha) irrigation system. Assuming a surface irrigation without a run-off return system, it will result in 87 $tCO_2eq$ emitted for its construction. We assume no emissions come from its operation since they do not rely on fossil fuel. In addition, for the irrigated farms, improvements in farming practices are expected because of the training that the project will bring. Water, soil (reduced tillage), and residue management practices will improve soil carbon and could sequester an estimated *-67,809* $tCO_2eq$ per year.

**I.D.** Potable water systems: A total of 64,512 households are expected to benefit from this intervention. Based on MIADP data, we calculated the emissions from the construction of the water tanks, done in steel with an average 42 $m^3$ capacity per 300 households. This means an emission of 710 $tCO_2eq$.

**I.E.** Slaughterhouses: A total of 40 subprojects are expected, which will be built on 58,318 $m^2$ of land. Emissions will come mainly from the construction. Generally, post-farm emissions for meat are negligible[28] and not counted. The building will be made of concrete, meaning 38,257 $tCO_2eq$ will be emitted through its construction. This intervention is not expected to change livestock farming in the region.

**I.F.** Agriculture Tramline System (ATS): A total of 930 m of ATS will be built. From PRDP experience, each tramline is about 125 m, implying around 7 subprojects. Previous studies cite an average consumption of 610 liters of diesel per year and subproject, which means a total consumption of 4.3 $m^3$ per year. This translates into total emissions of 202 $tCO_2eq$ emitted per year. The introduction of ATS will likely decrease hauling costs, but no change in the farming systems is expected.

**I.G.** Fish Landing: A total of 7 subprojects are expected to be built on 2,436 $m^2$ of land. An estimated 1,598 $tCO_2eq$ will be emitted from the construction of these agricultural buildings made of concrete.

**I.H.** Feeder Port: Only 1 subproject is expected to be built on 5,534 $m^2$ of land. An estimated 3,630 $tCO_2eq$ will be emitted from constructing these concrete agricultural buildings.

**I.I.** Watch Tower: Only 1 subproject is expected, to be built on 520 $m^2$ of land. An estimated 341 $tCO_2eq$ will be emitted from constructing this concrete agricultural building.

**I.J.** Composting facility: Only 1 subproject is expected, which will be built on 500 $m^2$ of land in total. An estimated 328 $tCO_2eq$ will be emitted from constructing this concrete agricultural building.

## *II.* Enterprises

**II.A. Small Enterprise**

II.A.i. Seaweed Production, Processing, and Trading: This intervention will support the production, processing/postharvest, and marketing activities of seaweed. Under the processing component, a consolidated center with a floor area of 200 $m^2$ will be built for each enterprise. This construction will result in 3,936 $tCO_2eq$ emitted for the 30 enterprises. Additional emissions are considered during its operational phase because of fossil fuel use. Based on the EFA model, it is estimated that 10 liters of fuel are needed per enterprise per cycle (pump boats and delivery trucks). Assuming five cycles per year, this yields a total of 1.5 $m^3$ of fuel per year, translating into 71 $tCO_2eq$ emitted per year. Emissions from production and processing are assumed to be negligible.

**II.B. Medium Enterprises**

II.B.i. Native Chicken Breeding, Production, and Marketing: 9 enterprises will be supported. They will engage in breeding, fattening, and marketing activities of native chickens. A 395 $m^2$ building will be constructed for each enterprise to produce 60,000 chickens per year; 30 percent to be sold live, and 70 percent as dressed chicken. Feeding was not considered for the GHG calculations since we assumed it will be locally sourced. Furthermore, GHG emissions from fattening are almost negligible, adding just 13 $tCO_2eq$ per year.

[28] Opio, C., P. Gerber, A. Mottet, A. Falcucci, G. Tempio, M. MacLeod, T. Vellinga, B. Henderson, and H. Steinfeld. 2013. Greenhouse gas emissions from ruminant supply chains – A global life cycle assessment. Food and Agriculture Organization of the United Nations (FAO), Rome.

This results from the low carbon footprint of its manure and enteric fermentation. However, 2,332 $tCO_2eq$ will be emitted from construction activities, 2,354 $tCO_2eq$ per year from electricity consumption, and 185 $tCO_2eq$ per year from transportation. The emission from electricity is reduced by 1 megawatt hour per year due to solar panel lighting as per subproject requirements. Since this is a high-productivity system, emissions from the breeding and fattening are also considered.

II.B.ii. Bangus Hatchery and Nursery Enterprise: Eight bangus enterprises will be supported. The enterprises will operate using three major facilities: broodstock, hatchery, and nursery. Emissions from the broodstock and hatchery facility construction only will be 1,155 $tCO_2eq$ per year. The nursery facility will operate in a 5-hectare pond, using semi-intensive culture. With 6 million fry per year, 70 percent is expected to survive as fingerlings. This nursery operation will result in 266 $tCO_2eq$ emissions per year. The production inputs will cause 819 $tCO_2eq$ in annual emissions because of urea and ammonium phosphate use. In addition, 3,903 $tCO_2eq$ will be emitted from electricity consumption. The emission from electricity is reduced by 0.5 megawatt hours per year, due to using solar panel lighting as per subproject requirements.

II.B.iii. Highland Vegetable Consolidation and Marketing: This intervention will fund 8 subprojects. Vegetables to be consolidated and marketed are cabbage, carrots, potatoes, broccoli, Chinese cabbage, bell pepper, baguio beans, cauliflower, and lettuce. This is a consolidation activity, so no change in the farming systems is expected. However, the project will produce emissions from construction and hauling activities. A total of 2,178 $tCO_2eq$ will be emitted during construction of the 415 $m^2$ consolidation center and another 119 $tCO_2eq$ from hauling activities.

II.B.iv. Corn Grains Terminal and Trading Enterprise: This intervention will fund 8 subprojects. The enterprise will process corn to produce feeds for hogs and poultry. Corn sources are assumed to come from different provinces, where the cooperative members will get premium prices. It is expected to consolidate 2090 metric tons of corn, of which, 1,200 metric tons will be processed into feeds, while the rest will be sold to other feed millers. This intervention will focus mainly on feed production; no change in farming systems is expected. However, the project will produce emissions from the construction of the metal silo with concrete flooring (669 $tCO_2eq$), transportation activities (853 $tCO_2eq$), and intense electricity use (3,738 $tCO_2eq$). The emissions from electricity will reduce by 0.8 megawatt hours per year due to using solar panel lighting as per subproject requirements.

II.B.v. Cacao Processing and Marketing Enterprise: A total of eight projected cacao processing enterprises will be supported through this intervention. Each enterprise requires the construction of a 250 $m^2$ processing building. The enterprise will buy dried fermented cacao beans from its partner groups and then process it into tablea, its main product. Fuel consumption from these activities will result in 2,629 $tCO_2eq$ emitted annually from equipment, and another 427 $tCO_2eq$ from hauling, and delivery. Another 2,221 $tCO_2eq$ will be emitted from electricity use during roasting, grinding, packaging, and other processing. The emission from electricity is reduced by 0.6 megawatt hours per year due to using solar panel lighting as per subproject requirements. This intervention will focus on cacao processing; no change in farming systems is expected.

II.B.vi. Swine Production, Processing, and Marketing Enterprise: The proposed enterprise will engage in swine breeding, hog fattening, and meat processing activities. Eight enterprises will be supported, each one assumed to build a 384 $m^2$ concrete building to fatten around 850 pigs per year, with three fattening cycles per year and a final weight of 90 kilograms per fattened pig. This operation will emit approximately 4,570 $tCO_2eq$ annually. GHG emissions from swine fattening production come from (a) $CH_4$ emissions from enteric fermentation; (b) $CH_4$ emissions from manure management; and (c) $N_2O$ emissions from manure management. In addition, electricity use and hauling will produce 1,069 $tCO_2eq$ and 34 $tCO_2eq$ annually, respectively. The emission from electricity is reduced by 0.9 megawatt hours per year due to using solar panel lighting as per subproject requirements. Finally, the construction of the buildings will emit another 2,015 $tCO_2eq$. Feeding was not considered for the GHG calculations since we assumed it will be locally sourced.

II.B.vii. Green Coffee Beans Production and Marketing Enterprise: Eight coffee processing enterprises will benefit from this intervention, each with a facility of 792 $m^2$. The enterprise will buy green coffee beans from the farmers through contract farming. Hence this intervention will significantly impact the coffee production systems, and we assume that the current farming practices of the beneficiaries will be more climate-smart with the project. Around *-32,838* $tCO_2eq$ could be sequestered on 6,032 ha of farms because of regenerative agriculture practices and reduced tillage that will improve soil carbon. On the other hand, annual emissions are expected from fuel consumption during hauling and delivery (1,062 $tCO_2eq$) and processing (1,840 $tCO_2eq$). Each enterprise is also expected to emit 146 $tCO_2eq$ per year from electricity use, which is reduced by 1.8 megawatt hours per year due to using solar panel lighting as per subproject requirements. Finally, the construction of the facility will produce 4,156 $tCO_2eq$.

II.B.viii. Banana Trading, Processing, and Marketing Enterprise: Seven enterprises will be supported. The enterprise will address postharvest and marketing constraints in the value chain; no change in farming systems is expected. Establishing a 200 $m^2$ processing facility is anticipated for each enterprise, which will produce 918 $tCO_2eq$. No emissions are expected from the production, whereas hauling will consume 15 $m^3$ of fuel annually, resulting in 716 $tCO_2eq$ emissions. The processing center will also require 101.9 megawatt hours of electricity annually, i.e., 1,317 $tCO_2eq$ in emissions. This electricity consumption is reduced by 0.4 megawatt hours per year, due to using solar panel lighting as per subproject requirements.

II.B.ix. Rice Processing and Marketing Enterprise: Three rice processing enterprises will benefit from this intervention, each with a 608 $m^2$ warehouse. The enterprise will buy the aromatic rice from farmers; no change in the current production systems is expected. Annual emissions are expected from fuel consumption during hauling, delivery, and the service provision of land preparation using the four-wheeled drive tractor (1,840 $tCO_2eq$). Milling and drying activities are also expected to consume 358 megawatt hours of electricity annually where 0.5 megawatt hours will be from solar panel lighting, i.e., 4,632 $tCO_2eq$ emissions per year. In addition, the construction of the facility will produce 1,197 $tCO_2eq$.

II.B.x. Virgin Cococnut Oil Processing and Marketing Enterprise: Three coconut processing enterprises will benefit from this intervention, each with a 600 $m^2$ processing plant. The enterprise will buy the coconut from the farmers to produce coconut water and virgin coconut oil. No change in the farming systems is expected from the subproject. GHG emissions will come from fuel consumption during hauling and delivery (280 $tCO_2eq$ per year). Following the EFA cost tables, an average electricity consumption of 9,114 kilowatt hours per year is envisaged for each enterprise i.e., 346 $tCO_2eq$ in annual emissions because 0.5 megawatt hours will come from solar panel lighting. However, the facility's construction will produce 1,181 $tCO_2eq$.

**II.C. Large Enterprise**

II.C.i. Onion Consolidation and Trading with Cold Storage Facility Enterprise: Eight enterprises will be funded. Each will support the postharvest, consolidation, and marketing segments of the onion value chain by providing interventions such constructing cold storage facilities (1,912 $m^2$) with an estimated capacity of 60,000 bags of onions. The construction will emit 10,034 $tCO_2eq$. The enterprise will simply procure onion; no change in the farming systems is expected. Each cold storage facility is expected to consume a significant amount of electricity—around 573 megawatt hours per year (4.3 megawatt hours to come from solar panel lighting)—producing 59,201 $tCO_2eq$ emissions per year. Fuel consumption from hauling and delivery will also emit 33 $tCO_2eq$ per year.

6. **Most of the interventions emit $CO_2eq$, compared to the without-project scenario due to construction**. This is a direct consequence of the PRDP's goal to increase value chain resilience, profitability, and efficiency by promoting the construction and operation of processing facilities, new roads, and rural infrastructure. The only activities with carbon sequestration are the coffee agroforestry and the irrigated vegetables with water, soil, and residue management that improve carbon stock. However, the project is also expected to address climate vulnerabilities and bring innovation (techniques and new technologies) in the region, improving efficiency and reducing postharvest wastage in the long run. EX-ACT does not count such mitigation benefits but they will significantly offset the projects' emissions.

7. **Following the 2017 guidance note from the World Bank, "Shadow Price of Carbon in Economic Analysis", two high and low carbon price estimates are considered in the analysis.** In 2024, these low and high estimates equal US$44 and US$87, respectively, and thereafter the values increase with a growth rate of 2.25 percent per year. The annual shadow price of carbon (US$/$tCO_2eq$) is then multiplied by the yearly GHG emissions ($tCO_2eq$) to get the economic value for every year of the project.

8. **In terms of GHG emissions, if the project invests in the interventions described in the EFA, the total net carbon balance will reach an estimated average of +25,727 $tCO_2eq$ emissions per year of the project.** This corresponds to an estimated total of +514,543 $tCO_2eq$ emitted over the entire project life.

9. **In economic terms, the project will generate a negative NPV of US$9.51 million or US$19.03 million (for a 12 percent discount rate) during the whole project life for the low- and high-carbon price scenarios, respectively.**

Figure A4.1 presents the annual carbon balance across the project's 20-year lifetime, while Figure A4.2 shows the annual carbon costs during the same period for low and high carbon shadow price estimates.

**Table A4.1. Net Carbon Balance for Each Ex-Act Component**

| Components | | Net Carbon Balance | |
|---|---|---|---|
| | | $tCO_2eq$ Over the Whole Period Analysis | $tCO_2eq$/year Annual Average |
| **Land-use changes** | Deforestation | 0 | 0 |
| | Afforestation | 0 | 0 |
| | Other land use | 0 | 0 |
| **Cropland** | Annual | -67,809 | -3,390 |
| | Perennial | -32,838 | -1,642 |
| | Flooded rice | 0 | 0 |
| **Grasslands and livestock** | Grasslands | 0 | 0 |
| | Livestock | +4,582 | +229 |
| | Forest mngt. | 0 | 0 |
| | Inland wetlands | 0 | 0 |
| | Coastal wetlands | 0 | 0 |
| | Fisheries and aquaculture | +266 | +13 |
| | Inputs and investments | +610,340 | +30,517 |
| **Total emissions, $tCO_2eq$** + = Source / - = Sink | | **+514,543** | **+25,727** |

**Figure A4.1. Annual Carbon Balance, in tCO2eq (20-Year Project Lifetime)**

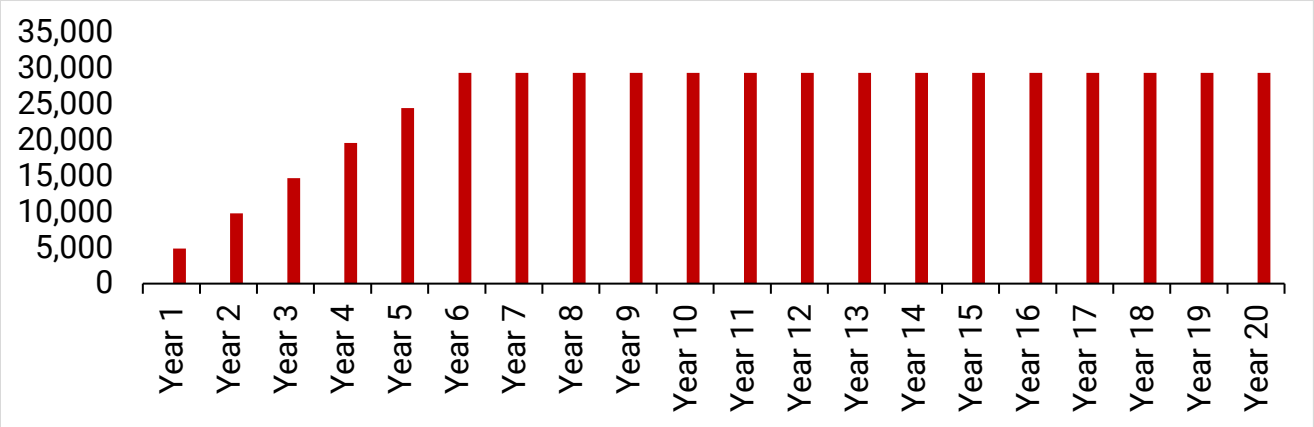
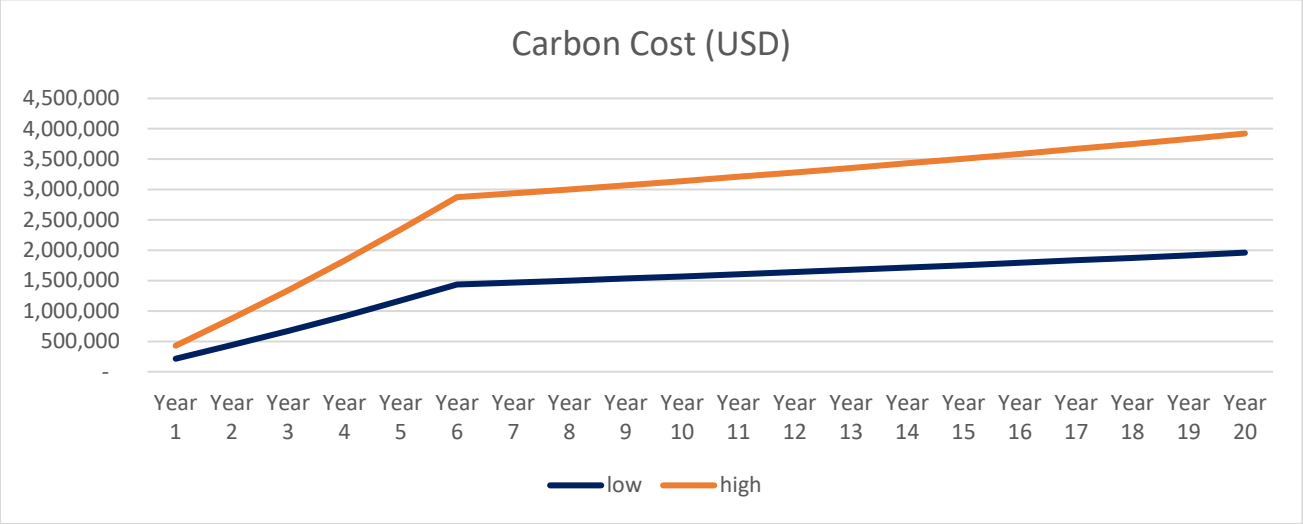


**Figure A4.2. Yearly Economic Carbon Costs during the Project Lifetime, for Low and High Estimates of Carbon Shadow Price**




**Part B: Climate Co-Benefits**

1. **The Philippines is already one of the world's most disaster-prone countries in terms of natural and climate-related hazards.** Typhoons, floods, volcanic eruptions, landslides, droughts, and earthquakes are the most common disasters affecting the country for the past 30 years. Historical trends from the World Bank Climate Change portal show that between 1951–1980 and 1991–2020, temperature and precipitation increased by +1°C and +280 millimeters, respectively. Under RCP 8.5[29], the multi-model ensemble shows that these trends will continue, with an estimated increase of +1.3 ° C and +30 millimeters by 2050. Under these changes in climate, typhoons, floods, landslides, and droughts are expected to be more damaging, especially in the agricultural sector. Temperature changes will also affect the length of the growing season, cause significant heat stress in farming, and reduce total available water because of increased evapotranspiration.

2. **Future climate trends will affect the whole agri-fisheries value chain in the Philippines because of its high vulnerability to extreme events.** As per World Bank's 2021 climate risk profile for the Philippines, a spatial analysis of how forecasted climate change impacts could affect agricultural land show that up to 85 percent of the country's strategically important agricultural land could be affected by typhoons, floods, and droughts. These disasters will affect farmlands and compound with the decrease in market connectivity due to road damages and a decrease in produce quality due to climate variability's impact on farmer behaviors, harvesting, and postharvest processing (Oria and Palconit 2022). In addition, increased water and heat stress caused by climate variability is expected to increase the incidence of pests and diseases, which could contribute to declines in fisheries and crop yields and shifts in suitability. If not addressed, all of this will weaken the adaptive capacity of the agri-fisheries value chain. Hence, it will be challenging for the proposed PRDP Scale-Up (PRDP SU) to achieve its PDO without tackling these climate vulnerabilities in the agri-fisheries sector.

3. **Climate change impacts the agro-fishery value chain at multiple points through multiple pathways.** At the

[29] RCP 8.5 is chosen to make the best judgement on the potential climate change risks in the without-project scenario.

production level, changes in water temperature, precipitation, and oceanographic variables, such as wind velocity, wave action, and sea level rise, can bring about significant consequences. Ecological and biological changes to marine and freshwater ecosystems and fish populations directly impact farmers and fisherfolk whose livelihoods depend on those ecosystems. Extreme weather events may also disrupt fishing operations and land-based infrastructure, where climate hazards make roads and trade routes impassable, disrupt market access, or destroy processing areas and facilities, incurring post-harvest losses. Fluctuations in fishery production and other natural resources can impact the livelihood strategies and outcomes of farmer and fisherfolk communities. Climate change compounds several social and economic drivers that facilitate the growing threat of a zoonotic spillover of emerging new diseases, making the Philippines a major hotspot. Climate impacts will likely exacerbate existing vulnerabilities and inadequacies in the country's animal health and food safety systems. It will further burden institutions that function reactively and have limited coordination mechanisms to prepare and respond to emerging new diseases and other climate challenges in the agro-fishery sector.

4. **A series of adaptation and mitigation measures will be considered during project implementation to achieve climate resilience.** Spending towards these actions will constitute the climate co-benefits of the project. The difference in costs of adaptation and mitigation between the baseline scenario were calculated to estimate the amount of spending towards climate measures, i.e., the current situation without the project and with-project scenario (subprojects and activities). A spending is considered adaptation- or mitigation-related based on the budget label and category. Only loan proceeds from IBRD were considered: roughly 80 percent of the total cost of Components 1 and 4, 74 percent of Component 2, and 64 percent of Component 3.

5. **This document presents a few cost tables for some I-BUILD subprojects showing which spending was considered adaptation- or mitigation-related, i.e., could be counted as part of the climate change budget.** The estimate is very conservative, i.e., while they show a difference between baseline and PRDP SU subprojects, some spendings are not considered because of their budget label and category. The rationale behind their exclusion is that they are not strictly PRDP SU-related and could have been added as features of business-as-usual interventions.

6. **The expected costs of all the climate interventions amount to US$333.51 million or 55.6 percent of IBRD financing**. Roughly 65 percent of this amount comes from adaptation measures addressing the climate vulnerabilities of agri-fisheries value chains through improved FMRs.

**Component 1: I-PLAN**

- A total of US$1.66 million of IBRD financing will be spent to guarantee that all subprojects and interventions in the project have a strong climate science basis. This amount represents 9.8 percent of Subcomponent (SC) 1.1 and 27 percent of SC1.2. In I-PLAN, research, studies, and planner trainings on climate risk screening will be conducted to assess climate risks to be able to identify appropriate climate adaptation measures. For each project location, the likelihood and extent (spatial and temporal) of the major climate hazards will be determined: floods, drought, landslide, erosion, storm surge, sea-level rise, salt water intrusion, and tropical cyclone. This information will then be integrated in the PCIP and will serve as roadmap for I-BUILD and I-REAP subproject design and implementation (from 2 to 12 below).

**Component 2: I-BUILD**

- The project will spend an extra US$216.4 million of IBRD financing (or 46.8 percent of SC2.1) to ensure roads are accessible in all weather. This intervention will mitigate the impacts of climate change on the local food systems and commodities value chains through the services provided by the roads. It is

important to note that there are already roads in project areas, but the goal is to ensure that climate is not the weak link in the agri-fisheries value chain by climate-proofing the FMRs. The actual physical risks will be identified and assessed from I-PLAN studies where the projected extent, frequency, and severity of floods, landslides, heavy rains, and hot days will be addressed. With the project, the current gravel roads will be made climate-proof, making them operational 100 percent of the time. The concrete reinforcing of FMRs will increase their lifespan which will support the country's climate adaptation and mitigation pathways. Without this intervention, farms will not be connected to market centers, innovations will be delayed, and the economic activities will be paralyzed during flooding or storm events, because several locations will likely be affected. In fact, 60 percent of municipalities in the Philippines are located along the coast where the risk of storm surge is high. Any road construction delay will also decrease farms' productivity because of delayed access to inputs, services, and innovations. Furthermore, FMRs can be classified as climate mitigation finance per the 2020 MDB list (4-4.1- Agricultural projects that improve existing agricultural wastes and carbon pools). FMRs provide mitigation benefits due to the improved efficiency of commodities value chain through efficient hauling and reduced waste. In addition, FMRs enable the efficiency of the enterprise subprojects under I-REAP, i.e., all the postprocessing activities that add value to the commodities and reduce postharvest waste will be much more realistic with FMRs. It is assumed that 10 percent of the FMRs investments will result in mitigation advantages.

- An additional US$25.76 million of IBRD financing will be spent on constructing all-weather bridges that enable the FMRs. This amount represents 5.6 percent of SC2.1. Instead of spillways, bridges at higher level will be built to ensure longevity and all-weather access of the bridge. Current spillway structures can no longer protect against projected future water levels. In addition, riverbank revetments will also be built to help manage water flow. These will further support the local ecosystems while improving the bridge's lifespan. Furthermore, it is important to note that bridges are essential for FMRs connected to the bridges and enable them. Without appropriate bridges, the climate-resilient features of these FMRs will be ineffective.

- An extra US$21.3 million of IBRD financing will be spent on addressing the flood risk potable water systems face. This amount represents 4.6 percent of SC2.1. Reservoirs and steel water tanks will be flood-proofed or elevated to allow a continuous clean water supply.

- In upland and rainfed areas, irrigation systems will be installed to alleviate heat and water stress to crops and reduce the risk of crop loss from recurrent droughts. There will be two types of irrigation systems: solar-powered systems which will use clean energy generated from solar panels, and gravity-fed systems which will have steel gates at each lateral canals to manage delivered volume and avoid flooding of each service area served. These systems will support about 2,500 ha of vegetables, for which irrigation is essential for productivity and climate adaptation (CIAT and DA-AMIA 2017). Improvement in agricultural practices brought along these infrastructures will reduce emissions by 67,809 tCO2eq per year. Furthermore, both systems can be classified as climate mitigation finance as per the 2020 MDB list (4-4.1- Resource efficiency in agricultural processes and supply chains). Hence, it is estimated that a total of US$10.82 million of IBRD financing (or 2.3 percent of SC2.1) will be climate measures spent for this intervention.

- Incorporating climate-resilient design into value chain infrastructures of public nature:
  - **A total of US$4.87 million of IBRD financing (or 1.1 percent of SC2.1) will be spent to ensure facilities**

**like abattoirs or dressing plants have the following green design features:** (a) typical embankment for leveling to avoid water ponding; (b) ground floors will be raised by 1 meter above the road level to ensure a floodproof facility (value will change depending on the actual assessed risk); (c) provision of stone masonry and/or slope protection; (d) higher materials specifications for truss due to adaptation of 300 km/h wind speed in the design (a 10 percent increase in unit weight); and (e) provisions of a drainage system for run-off and wastewater to protect the facility and the environment.

- **For fish landing and feeder ports, a boulder fill for the jetty/causeway will be confined or supported with steel sheet piles.** This is a more sustainable design against future storm surges and waves but will cost an extra US$1.43 million of IBRD financing. Jetties also limit coastal erosion and provide safe harborage. These facilities will also have solar streetlights, costing US$40,000 of IBRD financing. The total amount represents 0.3 percent of SC2.1.
- **A watch tower will be installed to help locals enforce climate-smart fisheries**. It will cost about US$240k of IBRD financing (or 0.1 percent of SC2.1) to build.
- **A new composting facility will also be constructed** to help minimize GHG emissions in the region. US$1.62 million of IBRD financing (or 0.4 percent of SC2.1) will be spent on this facility.

- A total of US$7.6 million of IBRD financing will be spent on the training and technical assistance of I-BUILD staff to help them comply with climate-resilience standards in all subprojects under I-BUILD (2 to 6 above). This amount represents 44.4 percent of SC2.2. This capacity building includes the mainstreaming of climate-related tools and innovations.

**Component 3: I-REAP**

- For I-REAP subprojects, there is no pre-defined portfolio, but they will be designed to promote innovations and climate-smart practices in the production and processing stages of the commodities value chains. Hence, the climate vulnerabilities will be addressed depending on the type of enterprise. And their share of costs will depend on both the subprojects' intent and cost tables. Cost tables based on similar enterprises in previous PRDP projects were used to estimate their share of spending towards adaptation and mitigation measures.

- For these subprojects, the severity of the actual risk will depend on I-PLAN studies, but the main climate risks that will be addressed for production are increased temperature and precipitation. Future flooding and landslides will also be considered in the design of storage or processing facilities. Furthermore, I-REAP is linked to FMRs and ATS in their classification as agricultural projects that improve existing agricultural wastes and carbon pools. In addition, the subprojects will promote efficient energy consumption or use of renewable energy to reduce their carbon footprint. These mitigation measures will be reflected mainly in the type of equipment, solar panel installations, solar dryers, and prime movers. Finally, all the storage and processing facilities built under the project will help reduce harvest losses and wastes, i.e., reducing GHG emissions.

- Overall, subprojects with the following characteristics will be prioritized for the I-REAP component of this PRDP Scale-Up:
  - **Crop, livestock, and fisheries' production environment**: Producers should adopt climate-smart agriculture practices, including using drought-, heat-, and pest-resistant crop varieties. Climate variability does not affect crop production in a controlled environment using greenhouses equipped with automated irrigation, humidity control and hydroponics systems for high-value crops, and

drip/sprinkler irrigation for field crops.
  - Civil works and facilities: Facilities will comply with the Philippine Green Building Code and be built to withstand floods, storms, and other natural disasters. They will include a waste management/treatment system; for cold storage, they will use an environment-friendly refrigeration system design with less harmful refrigerant. It is assumed that solar panels will mainly be installed to power lighting, not equipment.
  - Waste management: Enterprises with waste treatment facilities will be prioritized. Activities include recycling, composting, and converting the by-products into marketable outputs. However, waste treatment will be a requirement for fisheries or meat production and processing facilities.
  - Machineries and equipment: Energy-efficient equipment that produces minimum GHG during extreme weather will be used. As part of the country's mitigation efforts, these energy efficient features are indicated in the energy labels of cooling appliances and lighting equipment (Philippine Department of Energy 2022); and they will be considered for the purchase in PRDP SU per the Philippine Labelling Guide for Purchasing Appliances. For postprocessing, the facilities will use solar energy when possible, especially for drying. No auxiliary units using fossil fuel energy will be added to solar dryers to prevent extra GHG emissions. We assumed that roughly 10 percent of extra energy use will be avoided by opting for conventional solar drying while ensuring premium quality of dried products (Khalifa et al. 2012; Udomkun et al. 2020).
  - More details on each adaptation and mitigation measure can be found in the "ccb_list.pdf" file.

- These additional measures to address climate vulnerabilities in enterprise subprojects are estimated to amount to US$18.47 million of IBRD financing or 33.7 percent of SC3.1. Here is the estimated share of climate-related spendings per enterprise type:
  - Crop production: 27 percent (23 percent adaptation and 4 percent mitigation).
  - Livestock and poultry breeding and production: 22 percent (11 percent adaptation and 11 percent mitigation).
  - Fisheries production facilities (hatcheries, fishponds, etc.): 58 percent (54 percent adaptation and 4 percent mitigation).
  - Cold Storage facilities for high-value crops like onion, meat, and fish: 24 percent (20 percent adaptation and 4 percent mitigation).
  - Primary postharvest processing (drying, milling, etc.), dry storage, and packaging for grains and other bulk produce: 37 percent (28 percent adaptation and 9 percent mitigation).
  - Fish, meat, or dairy processing plants with cold storage: 20 percent (10 percent adaptation and 10 percent mitigation).
  - Crop postharvest and processing plants: 52 percent (42 percent adaptation and 10 percent mitigation).
  - Multicommodity consolidation centers, marketing/trading hubs, food terminals: 31 percent (28 percent adaptation and 3 percent mitigation).

- US$1.57 million of IBRD financing will be spent on training and technical assistance of I-REAP staff and FCAs to help them comply with climate resilience standards in all subprojects under I-REAP (8 to 11 above). This amount represents 9.7 percent of SC3.2. This capacity building includes training on climate-smart production and processing of agri-fisheries commodities and developing disaster risk reduction measures for the enterprises.

**Component 4: I-SUPPORT**

- Project staff in I-SUPPORT will also be capacitated with environmental impact assessment, climate risk management, and climate communication. These trainings will equip them with the skills to support I-PLAN, I-BUILD, and I-REAP activities and subprojects, especially those addressing climate vulnerabilities. Combined with all project support activities, these climate measures from I-SUPPORT are estimated at US$21.1 million of IBRD financing; 55.6 percent of I-SUPPORT will be spent on these adaptation measures. A total of US$3.2 million of this amount is spent on mitigation measures.

## ANNEX 5: Map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PHILIPPINES
SELECTED CITIES
PROVINCE CAPITALS
REGION CAPITALS
NATIONAL CAPITAL
RIVERS
MAIN ROADS
RAILROADS
PROVINCE BOUNDARIES
REGION BOUNDARIES
INTERNATIONAL BOUNDARIES
I Ilocos Region
1 Ilocos Norte
2 Ilocos Sur
3 La Union
4 Pangasinan
CAR Cordillera Admin. Reg.
5 Abra
6 Apayao
7 Benguet
8 Ifugao
9 Kalinga
10 Mountain Province
II Cagayan Valley
11 Batanes
12 Cagayan
13 Isabela
14 Nueva Vizcaya
15 Quirino
III Central Luzon
16 Aurora
17 Bataan
18 Bulacan
19 Nueva Ecija
20 Pampanga
21 Tarlac
22 Zambales
NCR National Capital Reg.
IV-A CALABARZON
23 Batangas
24 Cavite
25 Laguna
26 Quezon
27 Rizal
IV-B MIMAROPA
28 Marinduque
29 Mindoro Occidental
30 Mindoro Oriental
31 Palawan
32 Romblon
V Bicol
33 Albay
34 Camarines Norte
35 Camarines Sur
36 Catanduanes
37 Masbate
38 Sorsogon
VI Western Visayas
39 Aklan
40 Antique
41 Capiz
42 Guimaras
43 Iloilo
44 Negros Occidental
VII Central Visayas
45 Bohol
46 Cebu
47 Negros Oriental
48 Siquijor
VIII Eastern Visayas
49 Biliran
50 Eastern Samar
51 Leyte
52 Northern Samar
53 Samar
54 Southern Leyte
IX Zamboanga Peninsula
55 Zamboanga del Norte
56 Zamboanga del Sur
57 Zamboanga Sibugay
58 City of Isabela
X Northern Mindanao
59 Bukidnon
60 Camiguin
61 Lanao del Norte
62 Misamis Occidental
63 Misamis Oriental
XI Davao Region
64 Davao de Oro
65 Davao del Norte
66 Davao del Sur
67 Davao Oriental
68 Davao Occidental
XII SOCCSKSARGEN
69 Cotabato
70 Sarangani
71 South Cotabato
72 Sultan Kudarat
XIII Caraga
73 Agusan del Norte
74 Agusan del Sur
75 Dinagat Islands
76 Surigao del Norte
77 Surigao del Sur
BARMM Bangsamoro Autonomous Reg. in Muslim Mindanao
78 Basilan
79 Lanao del Sur
80 Maguindanao
81 Sulu
82 Tawi-Tawi
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PHILIPPINES
Luzon
Mindoro
Palawan
Panay
Negros
Cebu
Samar
Leyte
Bohol
Mindanao
Sulu Sea
Philippine Sea
Celebes Sea
Luzon Strait
Babuyan Channel
Mindoro Strait
Visayan Sea
Mindanao Sea
Moro Gulf
Leyte Gulf
Basilan
Lubang Islands
Polillo Islands
Batan Islands
Babuyan Islands
Cuyo Islands
Semirara Islands
Calamian Islands
Dumaran
Busuanga
Culion
Linapacan
Balabac
Bugsuk
Cagayan Sulu
Sibutu
Tawi-Tawi
MALAYSIA
Laoag City
Vigan
Bangued
Tuguegarao
Tabuk
Ilagan
Bontoc
Lagawe
Cabarroguis
San Fernando
La Trinidad
Baguio
Bayombong
Lingayen
Baler
Palayan
Tarlac
San Fernando
Iba
Balanga
Malolos
Quezon
Pasig
Antipolo
MANILA
Trece Martires
Santa Cruz
Calamba
Lucena
Batangas
Calapan
Mamburao
Boac
Marinduque
Romblon
Daet
Virac
Pili
Legazpi
Sorsogon
Masbate
Catarman
Catbalogan
Borongan
Naval
Tacloban
Kalibo
Roxas City
Iloilo
San Jose de Buenavista
Jordan
Bacolod
Cebu
Maasin
San Jose
Surigao
Siargao
Tagbilaran
Dumaguete
Siquijor
Mambajao
Cabadbaran
Tandag
Butuan
Prosperidad
Dipolog
Oroquieta
Cagayan de Oro
Iligan
Malaybalay
Marawi
Pagadian
Ipil
Tubod
Nabunturan
Tagum
Sultan Kudarat
Cotabato City
Davao
Kidapawan
Mati
Digos
Buluan
Isulan
Koronadal
Malita
General Santos
Alabel
Sarangani
Zamboanga
Isabela City
Lamitan
Jolo
Puerto Princesa
Bongao
0 50 100 150 Kilometers
0 50 100 Miles
120°E
125°E
20°N
10°N
5°N
I
II
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CAR
NCR
IV-A
IV-B
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XIII
BARMM
OCTOBER 2020

## REFERENCES

Climate Change and Food Security Analysis (CCFSA). World Food Programme (WFP), the Alliance of Biodiversity International and the International Center for Tropical Agriculture (CIAT). 2021.

Berondo, B. 2021. "Social Enterprises as Farmers' Bridges to the Digital Divide: The Case of GlowCorp". Power point Presentation during the 59th Annual Meeting and Conference of the Philippine Economics Society (PES) on November 11, 2021. (Unpublished)

CIAT and DA-AMIA. 2017. "Climate-Resilient Agriculture in Philippines". CSA Country Profiles for Asia Series. International Center for Tropical Agriculture (CIAT); Department of Agriculture - Adaptation and Mitigation Initiatives in Agriculture, Government of the Philippines. Manila, Philippines. 24 p.

DA (Department of Agriculture). 2021. "Mindanao Inclusive Agriculture Development Project (MIADP) Environmental and Social Management Framework". Available at: https://www.da.gov.ph/wp-content/uploads/2021/12/MIADP-ESMF-P173866-NOVEMBER-2021-VERSION-.pdf

DPWH (Department of Public Works and Highways). 2015. "The Philippine Green Building Code". Available at: https://www.dpwh.gov.ph/DPWH/sites/default/files/laws_codes_orders/PgbcBooklet23March.pdf

Gevaña, D., J. Pulhin, and M. Tapia. 2019. "Fostering Climate Change Mitigation through a Community-Based Approach: Carbon Stock Potential of Community-Managed Mangroves in the Philippines".

FAO. 2018. "Country Gender Assessment of Agriculture and the Rural Sector in the Philippines".

JICA. 2019. "Survey on Issue Analysis of Food Value Chain in the Philippines, Final Report, August 2019".

Khalifa, A.J.N., A.M. Al-Dabagh, and W.M. Al-Mehemdi. 2012. "An Experimental Study of Vegetable Solar Drying Systems with and without Auxiliary Heat". International Scholarly Research Notices, vol. 2012, Article ID 789324, 8 pages, 2012.

Lantican. 2023. "A Review of Available Data on Philippine Agricultural Crops and Fisheries and Case Studies on Farm Clustering, Contract Marketing, Online Selling Using Digital Platforms, and Vegetable Trading Centers", Unpublished Report, January 2023.

Llanto, G., and M. Quimba. 2021. "Competition Policy Issues in Cargo Services". PCC Issues Paper. Quezon City: Philippine Competition Commission.

Mataia, A.J., J.C. Beltran, R.G. Manalili, B.M. Catudan, N.M. Francisco, and A Flores. 2020. "Rice Value Chain Analysis in the Philippines: Value Addition, Constraints, and Upgrading Strategies". Asian Journal of Agriculture and Development 17(2):19-42.

Netherlands Enterprise Agency. 2017. "Philippine Agri-Food Sector Study, December 2017".

OECD. 2020. “OECD Competition Assessment Reviews: Logistics Sector in the Philippines”.

Oria, C.L. and E.V. Palconit. 2022. “Performance Investigation of an Inflatable Solar Dryer with Steel-Can Solar Air Heater for Drying Coffee and Corn”. Engineering, Technology & Applied Science Research Vol. 12, No. 3, 2022, 8707-8711.

Philippine Department of Energy. 2022. “Philippine Energy Labelling Program”. Available at: https://enerhiyangatin.ph/program/02-philippine-energy-labelling-program.html

PSA (Philippine Statistics Authority). 2021. “Official Poverty Statistics of the Philippines”, 1st Semester 2021.

PSA (Philippine Statistics Authority). First Semester Official Poverty Statistics Press Conference 17 December 2021.

PSA (Philippine Statistics Authority). Press Release 2020-327, October 28, 2020

Udomkun, P., S. Romuli, S. Schock, B. Mahayothee, M. Sartas, T. Wossen, E. Njukwe, B. Vanlauwe, and J Müller. 2020. “Review of Solar Dryers for Agricultural Products in Asia and Africa: An Innovation Landscape Approach”. Journal of Environmental Management, 268.

USDA (United States Department of Agriculture). 2019a. “Food Retail Sectoral Report, July 2019”. Foreign Agriculture Service.

USDA. 2019b. “Food Service - Hotel Restaurant Institutional Report, December 2019”. Foreign Agriculture Service.

USDA. 2021. “Food Retail Sectoral Report, July 2021”. Foreign Agriculture Service.

USDA. 2022. “Food Retail Sectoral Report, July 2022”. Foreign Agriculture Service.

World Bank. 2016. “Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by the IBRD Loans and IDA Credits and Grants”.

World Bank. 2010. “The Philippines: Study on Agri-Business, Infrastructure and Logistics for Growth in Mindanao”. Report No 54623-PH.

World Bank. 2019a. “Systematic Country Diagnostic of the Philippines: Realizing the Filipino Dream for 2040”.

World Bank. 2019b. “Human Capital Index”.

World Bank. 2020. “Transforming Philippine Agriculture During COVID-19 and Beyond”.

World Bank. 2021a. “Mandanas Ruling and Potential Implications for the Farm-to-Market Road Development Program: A Public Expenditure Review”.

World Bank. 2021b. “Realizing Scale in Smallholder-based Agriculture: Policy Options for the Philippines”.