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Report No: PAD5093

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON

A PROPOSED CREDIT

IN THE AMOUNT OF SDR 110.1 MILLION
(US$145 MILLION EQUIVALENT)

TO THE

KINGDOM OF CAMBODIA

FOR A

# CAMBODIA WATER SECURITY IMPROVEMENT PROJECT

MAY 30, 2024

Water Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(EXCHANGE RATE EFFECTIVE APRIL 30, 2024)

| | |
|---|---|
| Currency Unit = | CAMBODIA RIEL (KHR) |
| KHR 4,053 = | US$1 |
| US$1 = | SDR 0.758 |

FISCAL YEAR
JANUARY 1 - DECEMBER 31

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

| | |
|---|---|
| 3S | Sekong, Sesan, and Srepok river basins |
| 5P | Prek Preah, Prek Krieng, Prek Kampi, Prek Te, and Prek Chhlong river basins |
| ADB | Asian Development Bank |
| AFD | Agence Française de Développement |
| AWD | Alternate Wetting and Drying |
| CamGAP | Cambodia Good Agricultural Practices |
| CASDP | Cambodia Agricultural Sector Diversification Project |
| CERC | Contingent Emergency Response Component |
| CNMC | Cambodia National Mekong Committee |
| CPAS | Cambodian Public Accounting Standard |
| CPF | Country Partnership Framework |
| CaWSIP | Cambodia Water Security Improvement Project |
| CSA | Climate Smart Agriculture |
| DFAT | Department of Foreign Affairs and Trade |
| DFIL | Disbursement and Financial Information Letter |
| EIRR | Economic Internal Rate of Return |
| ENPV | Economic Net Present Value |
| ERR | Economic Rate of Return |
| ESCP | Environmental and Social Commitment Plan |
| ESMP | Environmental and Social Management Plan |
| ESF | Environment and Social Framework |
| ESMF | Environmental and Social Management Framework |
| ESS | Environmental and Social Standards |
| FAO | Food and Agriculture Organization |
| FM | Financial Management |
| FMM | Financial Management Manual |
| FWUC | Farmer Water User Community |
| GDA | General Directorate of Agriculture |
| GDP | Gross Domestic Product |
| GHG | Greenhouse Gas |
| GRM | Grievance Redress Mechanism |
| GRS | Grievance Redress Service |
| IFR | Interim Financial Report |
| IWRM | Integrated Water Resources Management |
| ISF | Irrigation Service Fees |
| JICA | Japan International Cooperation Agency |
| KOICA | Korea International Cooperation Agency |
| LASED III | Cambodia Land Allocation for Social and Economic Development Project III |
| LEA | Low Emission Agriculture |
| M&E | Monitoring and Evaluation |
| MAFF | Ministry of Agriculture, Forestry and Fisheries |
| MEF | Ministry of Economy and Finance |
| MISTI | Ministry of Industry, Science, Technology and Innovations |
| MOE | Ministry of Environment |
| MOWRAM | Ministry of Water Resources and Meteorology |

| | |
|---|---|
| NBC | National Bank of Cambodia |
| NDC | Nationally Determined Contribution |
| NSDP | National Strategic Development Plan |
| O&M | Operation and Maintenance |
| PDAFF | Provincial Department of Agriculture, Forestry and Fisheries |
| PDO | Project Development Objective |
| PDWRAM | Provincial Department of Water Resources and Meteorology |
| PIU | Project Implementing Unit |
| PMU | Project Management Unit |
| POM | Project Operations Manual |
| PPSD | Project Procurement Strategy for Development |
| PSC | Project Steering Committee |
| RBC | River Basin Committee |
| RBMP | River Basin Management Plan |
| RCP | Representative Concentration Pathway |
| RGC | Royal Government of Cambodia |
| RMF | Results Monitoring Framework |
| SEA/SH | Sexual Exploitation and Abuse/Sexual Harassment |
| SEP | Stakeholder Engagement Plan |
| SOE | Statement of Expenditures |
| SOP | Standard Operating Procedure |
| SRI | System of Rice Intensification |
| STEP | Systematic Tracking of Exchanges in Procurement |
| TOR | Terms of Reference |
| TWG-AW | Technical Working Group on Agriculture and Water |
| VEC | Valued Environmental and Social Component |
| WASAC | Water Supply and Sanitation Acceleration Project |

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## DATASHEET

### BASIC INFORMATION

| Project Beneficiary(ies) | Operation Name | | |
|---|---|---|---|
| Cambodia | Cambodia Water Security Improvement Project | | |
| Operation ID | Financing Instrument | Environmental and Social Risk Classification | |
| P176615 | Investment Project Financing (IPF) | 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 |
| [ ] Alternative Procurement Arrangements (APA) | [ ] Hands-on Expanded Implementation Support (HEIS) |

| Expected Approval Date | Expected Closing Date |
|---|---|
| 21-Jun-2024 | 30-Jun-2030 |
| Bank/IFC Collaboration | |
| No | |

### Proposed Development Objective(s)

The project development objective is to build the foundation for improved water security in Cambodia and increase agricultural productivity in Selected River Basins and to provide an immediate and effective response in case of an Eligible Crisis or Emergency.

### Components

| Component Name | Cost (US$) |
|---|---|
| Component 1: Improve water resources planning and institutions. | 10,000,000.00 |
| Component 2: Improve and sustain water service delivery for irrigation and domestic use. | 112,000,000.00 |
| Component 3: Support services to increase climate resilience in irrigated agriculture. | 18,000,000.00 |
| Component 4: Project management, coordination, and monitoring and evaluation. | 5,000,000.00 |
| Component 5: Contingent emergency response. | 0.00 |

### Organizations

| | |
|---|---|
| Borrower: | Kingdom of Cambodia |
| Implementing Agency: | Ministry of Agriculture, Forestry, and Fisheries, Ministry of Water Resources and Meteorology |

## PROJECT FINANCING DATA (US$, Millions)

### Maximizing Finance for Development

| | |
|---|---|
| **Is this an MFD-Enabling Project (MFD-EP)?** | No |
| **Is this project Private Capital Enabling (PCE)?** | No |

### SUMMARY

| | |
|---|---|
| **Total Operation Cost** | **150.00** |
| **Total Financing** | **150.00** |
| **of which IBRD/IDA** | **145.00** |
| **Financing Gap** | **0.00** |

### DETAILS

**World Bank Group Financing**

| | |
|---|---|
| International Development Association (IDA) | 145.00 |
| IDA Credit | 145.00 |

**Non-World Bank Group Financing**

| | |
|---|---|
| Counterpart Funding | 5.00 |
| Borrower/Recipient | 5.00 |

### IDA Resources (US$, Millions)

| | Credit Amount | Grant Amount | SML Amount | Guarantee Amount | Total Amount |
|---|---|---|---|---|---|
| National Performance-Based Allocations (PBA) | 145.00 | 0.00 | 0.00 | 0.00 | 145.00 |
| **Total** | **145.00** | **0.00** | **0.00** | **0.00** | **145.00** |

### Expected Disbursements (US$, Millions)

| WB Fiscal Year | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|---|---|---|---|---|---|---|---|---|
| Annual | 0.00 | 1.04 | 20.17 | 25.14 | 34.02 | 40.79 | 23.84 | 0.00 |
| Cumulative | 0.00 | 1.04 | 21.21 | 46.35 | 80.37 | 121.16 | 145.00 | 145.00 |

## PRACTICE AREA(S)

### Practice Area (Lead)

Water

### Contributing Practice Areas

Agriculture and Food

## CLIMATE

### Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

## SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

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

## POLICY 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

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

| E & S Standards | Relevance |
|---|---|
| ESS 1: Assessment and Management of Environmental and Social Risks and Impacts | Relevant |
| ESS 10: Stakeholder Engagement and Information Disclosure | Relevant |
| ESS 2: Labor and Working Conditions | Relevant |
| ESS 3: Resource Efficiency and Pollution Prevention and Management | Relevant |
| ESS 4: Community Health and Safety | Relevant |

| | |
|---|---|
| ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement | Relevant |
| ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources | Relevant |
| ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities | Relevant |
| ESS 8: Cultural Heritage | Relevant |
| ESS 9: 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**

**Legal Covenants**

| Sections and Description |
|---|
| Project Institutions (Project Steering Committee, Project Management Unit within MOWRAM, Project Implementation Unit within MOWRAM, Project Implementation Unit within MAFF at national level): Recurrent, Continuous Financing Agreement (FA), Schedule 2, Section I.A.2 (a)-(c): The Recipient shall maintain (a) a Project Steering Committee, (b) a Project Management Unit within MOWRAM; and (c) a Project Implementation Unit within MAFF, all with composition, functions, staff and resources satisfactory to the Association. |
| Project Institutions (at provincial level): Recurrent, Continuous FA, Schedule 2, Section I.A.2.(d): The Recipient shall at provincial level, prior to the commencement of any Project activity in the respective province, establish and thereafter maintain a technical team with composition, functions, staff and resources satisfactory to the Association. |
| Project Operations Manual: Recurrent, Continuous FA, Schedule 2, Section I.B: The Recipient shall carry out the Project in accordance with the Project Operations Manual, and not amend, abrogate or waive any provisions of the manuals unless the Association agrees otherwise in writing. |
| Environmental and Social Standards: Recurrent, Continuous FA, Schedule 2, Section I.D: The Recipient shall (i) ensure that the Project is carried out in accordance with the Environmental and Social Standards and the ESCP (including the management tools and instruments referred to therein) in a manner acceptable to the Association, (ii) not amend, repeal, suspend or waive any of the provisions of the said instruments unless the Association agrees otherwise, and (iii) report on their status of implementation as part of the project reports. |
| Performance-based Budgets: Recurrent, Continuous FA, Schedule 2, Section I.E: The Recipient, through MOWRAM, shall: (i) ensure that the Performance-based Budgets financed out of the proceeds of the Financing are made and administered in accordance with the Guidelines on Performance-based Budgets (as part of the Project Operations Manual) and the additional terms and conditions set forth in Section I.D of the Financing Agreement; and (ii) enter into Performance-based Agreement(s) with Eligible Beneficiaries under terms and conditions acceptable to the Association. |
| Contingent Emergency Response: In case of an Eligible Crisis or Emergency FA, Schedule 2, Section I.F: The Recipient shall (i) adopt a CERC Manual for implementation of Part 5 of the Project and prepare and adopt an Emergency Action Plan; both in form and substance satisfactory acceptable to the Association and ensure that the activities under the said part are carried out in accordance with such manual and plan and all relevant safeguard instruments; and (iii) not |

| |
|---|
| amend, suspend, waive or abrogate, repeal or waive any provisions of the manual unless the Association agrees otherwise in writing. |
| Annual Work Plans and Budgets: Recurrent, Continuous FA, Schedule 2, Section I.C: The Recipient shall prepare and furnish to the Association for its no-objection not later than [November 30] of each Fiscal Year of the Recipient during the implementation of the Project (or such later date as the Association may agree), an Annual Work Plan and Budget ("AWPB") for the Project as approved by the MEF, containing relevant Project activities and expenditures proposed to be included in the the Project in the following Fiscal Year, including a specification of the sources of financing for relevant expenditures, and environmental and social impact management measures taken or planned to be taken. |
| Mid-term Review Report: once, thirty-six (36) months after the Effective Date FA, Schedule 2, Section II.B: The Recipient shall: (a) on or about the date thirty-six (36) months after the Effective Date, prepare and furnish to the Association a mid-term report, in such detail as the Association shall reasonably request; and (b) review with the Association such mid-term report, on or about the date forty-five (45) days after its submission. |

**Conditions**

| Type | Citation | Description | Financing Source |
|---|---|---|---|
| Effectiveness | Financing Agreement: Article 4.01 | Additional Effectiveness Condition: Project Operations Manual FA, Article 4.01: The Recipient has adopted the Project Operations Manual in form and substance satisfactory to the Association. | IBRD/IDA |
| Disbursement | Financing Agreement: Schedule 2, Section III.B.1(b) | Disbursement Conditions FA, Schedule 2, Section III.B.1(b): The Recipient may not withdraw the proceeds of the Financing as allocated for Emergency Expenditures, unless and until: (A) the Recipient has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Association a request to withdraw Financing amounts under Category (4); and (B) the Association has agreed with such determination, accepted said request and notified | IBRD/IDA |

| | | | |
|---|---|---|---|
| | | the Recipient thereof; and (ii) the Recipient has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association. | |

## I. STRATEGIC CONTEXT

### A. Country Context

1. **Between 1998 and 2019, Cambodia was one of the fastest-growing economies in the world with a sustained average real growth rate of 7.7 percent.** Growth was driven largely by tourism, manufacturing exports, real estate, and construction. From 2009 to 2019/2020, the poverty rate in Cambodia declined from 33.8 percent to 17.8 percent. In 2015, the country reached lower-middle-income status; by 2030, Cambodia aspires to attain upper-middle-income status. During this period of growth, Cambodia achieved considerable gains in socioeconomic indicators, such as health and education, but equitable access to basic public services remains a challenge.

2. **In 2020, the economic shock caused by COVID-19 together with the consequences of devastating floods pushed Cambodia into its first recession in 25 years.** The pandemic caused global demand to decrease, supply chain disruptions, and nationwide lockdowns. At least 500,000 additional people were identified as poor in 2020. Key industries, including construction, tourism, and merchandise export, which together account for more than 70 percent of growth and 39 percent of total paid employment were significantly affected. Real GDP growth dropped sharply, from 7.1 percent in 2019 to negative 3.1 percent in 2020, gradually returning to 3 percent growth in 2021. To support the economic recovery, the Royal Government of Cambodia (RGC) introduced the 2021-2023 Economic Recovery Plan in December 2021, which introduced a transition to a climate-resilient and low carbon mode of development.

3. **Cambodia is highly vulnerable to the impacts of climate change, especially those related to the variability of precipitation and the frequency and intensity of floods and droughts.** Cambodia is particularly prone to flooding during the wet season, which runs from May to September, as 80 percent of the country is located within the Mekong River and Tonle Sap basins, and to prolonged droughts during the dry season. Over the past 20 years, Cambodia has faced substantial seasonal losses in crop production due to flooding and drought. Between 1987 and 2020, six major drought events affected over nine million Cambodians, significantly impacting the livelihoods of farmers and small land holders. Climatic events have disproportionately affected poor and vulnerable households. In 2020, severe flooding in 20 provinces affected 800,000 people; nearly 50 percent of these people belonged to poor and vulnerable households. Widespread damage to houses, agricultural lands, and key infrastructure, such as roads, bridges, irrigation schemes and dams, have resulted in an estimated loss of over US$450 million. Approximately 2.4 million people, or 15 percent of Cambodia's population, are defined as near poor[1] and are susceptible to falling back into poverty due to economic shocks, natural hazards, and environmental degradation. In addition, the Cambodia Country Climate and Development Report (CCDR)[2] shows that climate change is projected to reduce the country's GDP by 2.5 percent in 2030 and by up to 9.8 percent in 2050; this will impact the country's ability to reach upper-middle-income status. Without adequate adaptation measures, climate change could, depending on the climate scenario, increase the poverty rate by 0.3 to 6.0 percentage points by 2040.

### B. Sectoral and Institutional Context

4. **Cambodia is a water-rich country, but water resources are unevenly distributed across seasons and sub-basins.** Cambodia's water resource endowment is equivalent to 4,760 $m^3$ per capita compared to global average of 4,000 $m^3$ per capita. However, Cambodia experiences severe water shortages during the dry season, which lasts up to seven months a

[1] Defined as people whose daily per capita consumption lies between the poverty line and 1.25 times the poverty line.
[2] World Bank.2023. Cambodia Country Climate and Development Report. Washington, D.C: World Bank Group. https://documentsinternal.worldbank.org/search/34170164

year, triggering competing demands among agriculture, environment, industry, and domestic water supply. The Tonle Sap and Mekong River basins, the most densely populated areas of the country, are particularly susceptible to water shortages.

5. **Cambodia's limited capacity to manage its freshwater resources negatively impacts the availability of water supply for urban and rural consumption**. This is particularly critical given that Cambodia has an urgent need to accelerate access to meet the Sustainable Development Goal (SDG) 6 targets– universal access to safely managed water supply and sanitation (WSS) services by 2030**.** Currently, 94 percent of all water withdrawals in Cambodia go to the agricultural sector, mostly to irrigate rice paddies. During the 1970s, Cambodia constructed many small to medium-size reservoirs with one meter to two-meter-high earthen embankments to store water for supplementary irrigation and facilitate recession cultivation after the wet season. Many of these reservoirs and irrigation systems were constructed without adequate technical input, posing challenges for operation and maintenance (O&M). As a result, most of the existing infrastructure is currently in disrepair and requires rehabilitation and upgrading to meet modern agricultural productivity targets. This situation is particularly acute in the Tonle Sap; the Sekong, Sesan, and Srepok Rivers (3S); and the Prek Preah, Prek Krieng, Prek Kampi, Prek Te, and Prek Chhlong (5P)[3] basins. The high Water Deficit Index of these basins suggests that current agricultural water practices are unsustainable and will limit the water sector's capacity to respond to future climate shocks.

6. **Climatic projections of ever more frequent annual flooding during the wet season and severe droughts during the dry season stand to jeopardize both Cambodia's food production capacity and GDP growth going forward.** Disruptions to logistical corridors caused by floods have a profound impact on agricultural supply chains, both domestically and for international trade. The impact of prolonged periods of drought on yields is also significant. Under a high-emission scenario, wet season rice yields (rainfed) are expected to continuously decrease and could be reduced by up to 70 percent of current yield levels. Vulnerable groups may face food and nutrition crises in the event of extreme climatic events such as floods and droughts.

7. **The Royal Government of Cambodia embraces integrated water resources planning as a guiding principle for the strategic planning of priority water resource investments in order to enhance Cambodia's resilience to future climate shocks.** The National Water Resources Policy and the Water Law both require an integrated approach to water resources management (WRM) for sustainable and equitable water services. Under the Law on Water Resources Management of the Kingdom of Cambodia, promulgated in June 2007, four sub-decrees[4] were developed, and two of them enacted. Article 12 of the Water Law established provisions for water allocation and licensing. However, no sub-decree was enacted to formally apply water allocation rules and principles, causing confusion amongst various water users and the regulatory environment.

8. **The Cambodia Public Finance Review: *From Spending More to Spending Better*[5] identified several factors that constrain Cambodia's ability to sustainably increase the productivity of water resources, including:**

(a) **Capacity constraints at the national and subnational levels.** This is mainly due to a lack of experienced WRM and irrigation professionals in MOWRAM and within the Provincial Departments of Water Resources and

[3] The 3S and 5P river basins are located in the Upper Mekong basin and are part of the 39 river basins in Cambodia. The three basins (Sekong, Sesan and Srepok) are called the 3S river basins. These three river basins join and constitute an international river basin shared between Cambodia, Lao PDR and Viet Nam. The 5P river basins are the combination of the four river basins (Prek Preah, Prek Krieng, Prek Kampi, Prek Te, Prek Chlong) and have a total catchment area of 11,235 km$^2$. Prek Chlong is a river basin connected from the Prek Te and Mekong Delta basins.

[4] The four sub-decrees include a sub-decree on the procedures for the establishment of Farmer Water User Committees (FWUC) (enacted on June 30, 2018), a sub-decree on River Basin Management (enacted on July 10, 2015) setting out principles for sustainable water resource management at the river basin scale, a sub-decree on Water Allocation and Licensing (drafted in 2015 but not enacted due to disagreements on water pricing), and a sub-decree on Water Quality (drafted in 2015).

[5] Cambodia Public Finance Review: From Spending More to Spending Better, World Bank 2023

Meteorology (PDWRAMs). There are serious gaps in the data and information required for scientific analysis and informed decision-making for effective risk management and optimal utilization of water resources.

(b) **Institutional fragmentation and limited coordination across the ministries working in the water sector.** MOWRAM has expressed its goal to expand irrigated areas by 1.2 million hectares by 2033 in its National Water Resources Management and Sustainable Irrigation Roadmap and Investment Program (2019–2033). If this program is fully implemented, it will increase current water demand by up to 80 percent and will require close dialogue across the food-energy-water nexus.[6] Despite attempts by development partners, there has been limited strategic-level coordination between national and subnational governments, hindering effective management of water resources, and prospects for meeting the Government's objectives by 2033.

(c) **A lack of funding for subnational governments.** There are also insufficient funds available to adequately manage, operate, and maintain irrigation schemes and systems; this includes a lack of financing for O&M staff and to support Farmer Water User Committees (FWUC), leading to an overall deterioration of irrigation infrastructure and a reduction in agricultural production levels.[7]

9. **Agriculture is an important pillar in Cambodia's economy.** According to the 2020 Cambodia Agriculture Survey, 2.04 million households, equivalent to 57 percent of households in Cambodia, are involved in agricultural production, and more than 50 percent of these households depend on subsistence farming. This indicates that despite efforts to move toward export-oriented commercial agriculture, the country's agriculture sector remains focused on subsistence farming. Although the agriculture sector's contribution to national GDP has declined over the last decade from 33.5 percent to just over 22 percent as a result of the country's structural economic transformation, the sector still employs one-third of the country's labor force and provides livelihoods to approximately 80 percent of the population. In 2022, rice production accounted for roughly 59.3 percent of agricultural production.

10. **Rice production produces significant greenhouse gas (GHG) emissions and is highly vulnerable to climate variability.** In the absence of adaptation measures and even with the benefits of increased atmospheric concentrations of CO2 accounted for, yield losses of 10-15 percent could be expected by the 2040s under both Representative Concentration Pathways (RCP) 4.5 and RCP 8.5[8]. These losses are closely linked to an increase in temperature during the growing season. Strengthening approaches and techniques for climate smart agriculture (CSA) in sector development are becoming increasingly important. Adaptation and building resilience are key in responding to climate change challenges. Successful adaptations might also prepare the way for accessing carbon credit markets.

11. **Irrigation holds potential for enhancing agricultural productivity.** Cambodia has 4.5 million ha of arable land, with 4.0 million ha used for seasonal crops, mainly rice, and 0.5 million ha for permanent crops like rubber and fruit trees. Only one million ha of seasonal crops are irrigated. Expanding irrigation could increase rice yields significantly. Such a shift coupled with the adoption of modern agricultural practices, such as crop diversification, would allow farmers to transition to high-value crop cultivation with improved returns while boosting climate resilience and improving water use efficiency.

12. **Investments in irrigation infrastructure alone are insufficient to increase agricultural productivity.** In recent years, MOWRAM has been investing in irrigation infrastructure to boost agricultural productivity. Investments, however, have focused on the rehabilitation of infrastructure, and O&M arrangements remain inadequate. Despite several projects financed by donors to strengthen the capacities of the PDWRAMs and FWUCs to implement operation and maintenance functions, persistent challenges related to technical capacity and budget limitations remain a bottleneck for the delivery

[6] Cambodia Country Climate and Development Report. Washington, D.C: World Bank, 2023
[7] Public Expenditure Review for water and irrigation, World Bank, 2023
[8] Li et al. (2017). Influence of the Representative Concentration Pathways (RCP) scenarios.

of adequate irrigation water services to farmers. Consequently, approximately half of the irrigation systems are only partially operational, resulting in erratic irrigation and drainage services that undermine agricultural productivity.

13. **Strengthening women's role in WRM is central**. According to a recent gender analysis of the water sector, women are the principal users of water (see Annex 3). Women constitute the majority (52.2 percent) of the active agricultural population, as well as the majority (62 percent) of the members of agricultural cooperatives. Despite women's prominent role in agriculture, their representation in community organizations, such the FWUCs and RBCs, remains low—only 14 percent of overall FWUC members and 22 percent in project areas are women and leadership positions are almost entirely held by men. Multiple barriers limit women's participation in FWUCs and RBCs, including gender norms that discourage women from holding public offices. The majority of FWUCs are chaired by local political and administrative leaders, such as the village/commune chiefs, and women are largely underrepresented in these positions.

14. **Ministry of Water Resources and Meteorology (MOWRAM) is mandated by law as the authority for policy, regulation, and management of investments related to water resources, irrigation, and flood management.** MOWRAM coordinates with different sector ministries at the national level on matters related to water use and management of water resources, including: (i) irrigation with the Ministry of Agriculture, Forestry and Fisheries (MAFF); (ii) domestic water supply with the Ministry of Industry, Science, Technology, and Innovation (MISTI); and (iii) environmental management with the Ministry of Environment (MOE). MOWRAM also hosts the National Committee on the Mekong which collaborates with the Mekong River riparian countries and the Mekong River Commission (MRC) on Mekong affairs and transboundary water resources management. At the provincial level, corresponding sectoral departments, such as the Provincial Department of Water Resources and Meteorology (PDWRAM) and the Provincial Department of Agriculture, Forestry, and Fisheries (PDAFF) are in place to coordinate field implementation and monitor activities on site. The operating capacity of the provincial departments, however, remains limited. Although Cambodia has made efforts to develop a wide range of policies and regulations to support WRM, much needs to be done to operationalize them. For instance, the decree on river basin management has not been institutionalized, and sector agencies and stakeholders have yet to work together to establish subnational river basin committees (RBCs) for integrated basin planning and operational management.

### C. Relevance to Higher Level Objectives

15. **The project is in line with the RGC's vision and overall development strategy for the country as encapsulated in its five-year Pentagonal Strategy Phase I (PS-I, 2023-2028) for growth, employment, equity, efficiency, and sustainability**. The PS-I commits to building the foundation for achieving Cambodia's vision for 2050. The water sector is recognized as a priority area for the promotion of agriculture and rural development, for ensuring environmental sustainability and readiness for responding to climate change, and for the promotion of a green economy. The PS-I formulates actions for enhancing water security in Cambodia. This includes strengthening water resources planning and institutions, developing WRM infrastructure, and enhancing O&M services.

16. **The proposed project is aligned with the priorities in the World Bank Group's Cambodia Country Partnership Framework (CPF) FY2019–2024 (Report No. 136500-KH),** and continues to be relevant in the Performance and Learning Review (PLR) (Report No. 169297-KH) especially CPF Objective 7 'Strengthening management of water and land use', and contributes to the World Bank Group's mission, 'to end extreme poverty and boost shared prosperity on a livable planet'. It also contributes to one of the eight global challenges (Water Security and Access) prioritized by the WBG.[9] The CPF highlights the support on developing WRM models and identifies the Mekong River and other river basins affiliated with the Mekong River as key areas for Cambodia's future. This objective also identifies the link between poor WRM and water

[9]Ending Poverty on a Livable Planet: Report to Governors on World Bank Evolution Development Committee September 27, 2023.

productivity. The CPF underlines the importance of natural resources for Cambodian people's lives and livelihoods. In addition, the Project Development Objective (PDO), which emphasizes effective WRM, is strongly aligned with the CPF's cross-cutting theme of Strengthening Governance, Institutions and Citizen Engagement.

17. **The project will address water security under climate change circumstances by improving water security for multiple water users, resilient irrigation services and improving water productivity for agricultural and domestic use.** In addition, the project will strengthen the Government's capacity in integrated water resources management, which will contribute to enhance the country's resilience to floods and droughts. The project seeks alignment with the findings of the Cambodia CCDR, for which the project will improve climate resilient irrigation to increase food production and water productivity while reducing flood and drought risks through sustainable water resources management. The project is also closely aligned with the recommendations of the CCDR, which highlighted the need for targeted investments on rehabilitation, repurposing, and retrofitting of existing water infrastructure in order to meet future water demand sustainably.

18. **The project is consistent with Cambodia's climate and development priorities.** The project is aligned with the goals of the Nationally Determined Contribution (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) on both adaptation and mitigation. The specific NDC goals that this operation will support include strengthened flood resilience capacity of targeted communities, scaling up climate-resilient agricultural production through climate-smart agricultural (CSA) practices, as well as increased sustainability of agricultural land management techniques. The project is also aligned with the National Adaptation Plan, specifically on: (a) promoting climate resilience through improving food, water, and energy security; (b) improving capacities to reduce sectoral, regional, and gender vulnerability and health risks to climate change impacts; and (c) increasing knowledge and awareness for climate change responses. The project is also aligned with the Long-Term Strategy for Carbon Neutrality (LTS4C) as it promotes low-carbon agriculture and CSA approaches, including Alternative Wetting and Drying (AWD) and system of rice intensification (SRI). Finally, the project is aligned with the Cambodia Climate Change Strategic Plan (CCCSP) 2014–2023, and the NSDP 2019–2023.

19. **The project is aligned with MOWRAM's National Water Resources Management and Sustainable Irrigation Roadmap and Investment Program (NWRM-SIRIP) (2019–2033).** The Program lays out the long-term vision as well as the investment and institutional development plan for adopting Integrated Water Resource Management (WRM) and providing sustainable irrigation services. The Program has a total estimated investment cost of US$2.6 billion. With the NWRM-SIRIP, the RGC is committed to modernizing water storage, irrigation, and flood control systems following an integrated approach and improving the management and institutional capacity of related water service delivery. This includes management reforms at the river basin and water system levels, promotion of self-sustaining FWUCs, and involvement of the private sector in water system O&M and service delivery.

## II. PROJECT DESCRIPTION

### A. Project Development Objective

**PDO Statement**

20. The PDO is to build the foundation for improved water security in Cambodia and increase agricultural productivity in Selected River Basins and to provide an immediate and effective response in case of an Eligible Crisis or Emergency.

**PDO-level indicators**

21. The achievement of the PDO will be measured through the following indicators:
(a) Climate-informed River Basin Management Plans for selected basins, prepared and endorsed (number);
(b) People benefitting from improved water service delivery (number); and
(c) Increased crop productivity (percentage).

22. **The project envisions to set the fundamentals of IWRM with the RGC to improve water security and increase agricultural production of irrigated land in Cambodia**. Its design draws upon the experience and lessons learnt from the World Bank financed Mekong-Integrated Water Resource Management Phase III (M-IWRMPIII) Project which laid the groundwork for establishing multi-sectoral collaborations to enhance water resource monitoring and planning at river basin scale through the principle of Integrated Water Resources Management (IWRM) in Cambodia. While the current project will not address all dimensions of water security[10] in Cambodia, it will contribute to achieving water security at different levels. At the national level, it lays the foundation for the adoption of IWRM policies and planning and builds the institutional capacity of MOWRAM (Component 1). At the river basin level, it supports the rehabilitation and upgrading of existing water resources management infrastructure and improving water service delivery for irrigation and domestic purposes (Component 2). Component 2 also plays a pivotal role in strengthening the IWRM-Agriculture Nexus as it establishes a link between enhanced water supply services and increased agricultural productivity. Therefore, the implementation of this component will require close coordination between MOWRAM and MAFF. Under Component 3, the project aims to further enhance agricultural productivity by adopting CSA approaches to mitigate climate risks in irrigated agriculture, leading to increased farmer incomes and greater resilience against climate shocks.

## B. Project Components

23. The project consists of three interconnected technical components, a Project Management Component, and a Contingent Emergency Response Component (CERC).

24. **Component 1: Improve Water Resources Planning and Institutions (US$10.0 million, IDA).** This component will finance activities that contribute to laying the groundwork for improved water resources management in Cambodia. This involves strengthening the national systems for monitoring, planning, and managing water resources at the basin level. The component will support: (a) the upscaling of hydro-met stations to enhance water resources management and improve the reliability of water service delivery; (b) the updating of existing IWRM policies and regulations; (c) the preparation and endorsement of climate-informed river basin management plans (RBMPs) for three river basins; and (d) institutional strengthening of MOWRAM and provincial stakeholders across component activities.

25. **Subcomponent 1.1: Strengthening Water Resources Institutions and National Policies (US$2.0 million, IDA).** This subcomponent will finance consulting services to support the reforms and capacity building necessary for effective management of water resources under climate change impacts, specifically floods and droughts. It will support: (a) a review of and contributions to key legislation and policy documents, including two sub-decrees on water allocation and licensing and water quality management; (b) the development of dam safety practice guidelines that incorporate climate risk actions for the selected subprojects; and (c) development of a national dam safety framework to uniformly and through a structured approach address O&M procedures for single- and multi-purpose reservoirs in Cambodia.

[10] Grey and Sadoff (2007). Water security defines as the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies. The project will place emphasis on addressing the quantity dimension.

26. **Subcomponent 1.2: Water Resources Monitoring and Information (US$3.5 million, IDA).** This subcomponent will strengthen government systems for the collection, analysis, and dissemination of data and information required for effective, climate informed WRM, including flood and drought management, at the national and local levels. Activities under this subcomponent include: (a) the purchase, installation, and operation of four hydro-met stations for selected river basins; (b) the purchase, installation, and operation of a sensor-based automated system for water distribution; (c) technical assistance for the establishment and management of databases and updating and calibrating of existing hydraulic/hydrological models using the new database structure within MOWRAM; (d) the purchase of high-performance computing power for running the models; (e) the establishment of a national risk-based monitoring framework for dam safety and operation; and (f) the setting up of transboundary data-sharing arrangements.

27. **Subcomponent 1.3: Strengthening of Basin Governance and Planning (US$4.5 million, IDA).** This subcomponent will finance: (a) the preparation and operationalization of RBMPs for the Prek Te and Sre Pok sub-basins within the larger Mekong River basin and other basins to be selected in conjunction with MOWRAM; (b) the establishment and strengthening of RBCs for these basins; (c) the setting up of a comprehensive and participatory stakeholder engagement process; and (d) strengthening transboundary water cooperation through dialogue and the development of a knowledge exchange program focused on developing a transboundary approach to address climate change.

(a) The RBMPs will be developed under the leadership of MOWRAM and offer a longer-term outlook that factors in climate risks and basin development perspectives. Additionally, the RBMPs will create an avenue for integrating a nature-based planning approach, involving the conservation of existing natural assets and the incorporation of nature-based solutions to reduce flood and drought risks. This will allow for sustainable and environment-friendly measures to be woven into the basins' development strategies. The RBMP process will start with the development of a stakeholder engagement and capacity-building plan that will include a program to specifically target women; implementation of the plan will be monitored as part of the Gender Action Plan (GAP).

(b) RBCs will act as instruments for basin governance and for coordination with stakeholders to identify the trade-offs that must be managed at the basin level, including the coordination and allocation of water for irrigation, bulk water supply services, and environmental needs, while considering the impact of climate change-exacerbated droughts and floods on the basins' available water resources. RBCs established under this project will require that at least 30 percent of members are women representation and at least two women in leadership positions in each RBC. This subcomponent will identify the key impediments to the functioning and performance of RBCs within the PDWRAMs and address these by building technical and institutional capacity.

28. **Component 2: Improve and Sustain Water Service Delivery for Irrigation and Domestic use (US$112.0 million, IDA).** To achieve the delivery of improved and sustained water services to end users, the component will: (a) finance, rehabilitation and upgrading of targeted existing water resources infrastructure; (b) establish and train new staff in existing FWUCs and support the financial sustainability of the FWUCs; and (c) provide technical assistance to the PDWRAMs/FWUCs for improved O&M of the upgraded and rehabilitated water resources and irrigation infrastructure. Rehabilitation efforts will focus on existing multipurpose water resources infrastructure, encompassing enhanced dam safety measures and increased water retention capacity. This will increase climate resilience through providing an additional buffer during dry periods for irrigation and domestic use while also contributing to flood control during periods of intense precipitation. In addition, the component will finance the upgrading of existing irrigation facilities and automate the operation of the irrigation systems to enable improved and climate-resilient water service delivery to end users.

29. **Subcomponent 2.1: Rehabilitation and Upgrading of Multi-purpose Water Resources Infrastructure (US$33.5 million, IDA).** This subcomponent will enhance resilience against climate change-exacerbated hydrological shocks by

improving irrigation, boosting sustainable water supply availability, enhancing flood control, and increasing environmental benefits in the Svay Chrum and Srae Huy sub-basins of 3S and 5P. Activities include: (a) strengthening dyke structures to manage erosion and mitigate potential reservoir failures caused by increased intensity and frequency of extreme events; (b) raising crest levels, broadening the width, and extending the length of existing embankments for supplementary water availability for irrigation. These interventions will enhance water security during periods of drought and/or contribute to flood mitigation; (c) rehabilitating and modernizing discharge gates and spillways to reduce flood overtopping and failure risks due to climate extremes and fitting them with automatic and/or mechanical control systems that lower O&M costs; and (d) supporting the annual O&M of dams and reservoirs during the project duration following standard MOWRAM O&M procedures for dams and reservoirs. This subcomponent will also finance the preparation of feasibility studies, engineering designs and construction activities, including the integration of nature-based solutions for increased flood and drought risk management. Investments may also involve facilities for bulk water offtake for domestic use that will require support to strengthen water resources coordination between MOWRAM and MISTI as well as investments to support the sustainable management of water resources during climate-induced drought.

30. **Subcomponent 2.2: Rehabilitation and Upgrading of Irrigation Infrastructure (US$73.5 million, IDA).** The subcomponent will finance the rehabilitation of existing irrigation systems for the Svay Chrum and Srae Huy sub-basins of the 3S and 5P. This includes: (a) the rehabilitation and upgrading of intake facilities and water regulating structures to enhance the resilience of critical infrastructure to climate risks and for improved water resources management; (b) the modernization of small-scale water storage units for enhanced drought risk management; (c) the rehabilitation of drainage and irrigation canal systems for improved climate change exacerbated flood risk management; and (d) supporting the annual O&M of irrigation systems throughout project implementation following standard MOWRAM O&M procedures for irrigation systems. This subcomponent will also finance the preparation of the feasibility studies, engineering designs and construction activities for selected irrigation systems in flood and drought-prone areas that will be selected in the first year of the project. Modernizing water storage units within the irrigation schemes will further enhance water availability and serve as an additional buffer during drier periods.

31. **Subcomponent 2.3: Improving Institutional, Technical, and Financial Capacity of PDWRAMs and FWUCs to Deliver Better Water Services (US$5.0 million, IDA).** The subcomponent will build institutional and technical capacity of the PDWRAMs and FWUCs of the Svay Chrum and Srae Huy irrigation schemes and will establish financial arrangements to ensure that last-mile irrigation services to farmers are delivered in a timely and efficient manner. Activities will include: (a) establishing new and strengthening existing FWUCs to build capacity in delivering irrigation services; (b) building capacity of PDWRAM staff, including awareness raising on the importance of gender inclusive representation in water resource related decision-making, to support the FWUCs in delivering inclusive irrigation services and to prepare guidelines to address climate-exacerbated floods and droughts; (c) reviewing existing and preparing new gender-inclusive farmer-centered guidelines/manuals on O&M for canals, embankments, headworks, and other water control infrastructure; and (d) providing performance-based budgets for setting up mechanisms for the collection of irrigation service fees to cover the costs of O&M[11]. The performance-based budgets will ensure the transfer of funds to PDWRAMs and FWUCs based on performance indicators that measure sub-national stakeholder engagement, site supervision, and O&M services.The project will ensure meaningful participation of women and other underrepresented groups in the FWUCs.

32. **Component 3: Support Services to Increase Climate Resilience in Irrigated Agriculture (US$18.0 million, IDA).** This component aims to enhance crop productivity through improved farm-level actions and institutional strengthening at the national and local levels. It will support the MAFF, the Provincial Department of Agriculture, Forestry and Fisheries

[11] Please see E. Performance-based Budgets in the Financing Agreement for a detailed description.

(PDAFF), and local stakeholders. It will support: (a) building capacity at MAFF and PDAFF to support farmers' adoption of climate smart technologies and practices, such as CSA, Low Emission Agriculture (LEA), and efficiency improvements in the use of agricultural inputs, to simultaneously improve the resilience of irrigated agriculture to climate shocks, increase productivity, and reduce carbon and methane emissions; (b) building technical and institutional capacity of national/local research institutions and technical departments to effectively develop and transfer knowledge on improving climate-smart and low-emission agricultural practices and value addition to farmers. The piloting and demonstration activities financed by this component are designed to pave the way for scaling up suitable and economically viable techniques beyond the lifespan of the project.

33. **Subcomponent 3.1: Improved Technology Adoption (US$10.0 million, IDA).** This subcomponent will finance: (a) the piloting of the adoption of CSA/LEA techniques and approaches in demonstration areas and field trials to help farmers reduce their vulnerability to climate risks; (b) the piloting of input-saving technologies related to the efficient use of water, fertilizer, pesticides and other agricultural inputs; (c) supporting the adoption of circular agriculture production models to manage by-products (crop residues) and reduce waste; (d) piloting the adoption of LEA to contribute to lowering emissions from farming; (e) enhancing agro-biodiversity and soil health that include the use of native seed varieties and soil rehabilitation projects; (f) providing training to farmers to enhance farmer skills on system operation and management of Svay Chrum and Srae Huy irrigation schemes; and (g) providing training program to MAFF and PDAFF to assist farmers in adopting modern farming techniques and approaches. It will also cover the expenses for equipment, technological devices, and initial setup costs of demonstration sites to train farmers on all aspects of this sub-component.

34. **Subcomponent 3.2: Improved Service Delivery (US$8.0 million, IDA).** This subcomponent aims to strengthen the institutional and technical capacity of both public and private stakeholders, such as MAFF, PDAFF, the Royal University of Agriculture (RUA) and other private sector partners, to further develop existing capabilities in CSA and LEA in Cambodia. Key activities include: (a) piloting e-extension and certification to support adoption of CSA and LEA agriculture practices; (b) capacity building for research institutions and technical departments for effective technology transfer in CSA. This involves training programs, workshops, and the provision of resources to facilitate effective technology transfer and the adoption of CSA, including where possible, AWD for rice production systems; (c) enhancing private and public service delivery engagement functions (extension, skills, technology) and infrastructure of both private and public agricultural service providers; and (d) providing support to strengthen farmer groups and agricultural cooperatives to enhance their capabilities in collective purchasing, marketing, and the adoption of sustainable agricultural practices.

35. **Component 4: Project Management, Coordination, and Monitoring and Evaluation (US$5.0 million IDA and US$5 million from RGC).** This component provides supports to MOWRAM and MAFF for project management and incremental costs including: (a) communication and outreach; (b) specialized individual consultants; (c) equipment; and (d) incremental operating costs.

36. **Sub-component 4.1: Project Management, Coordination, Monitoring and Evaluation under MOWRAM (US$ 3 million IDA and US$3 million from RGC)**. This subcomponent provides technical and operational support for the implementation of MOWRAM's Respective Part of the Project, including: project management and coordination, including financial management and disbursement, procurement, environmental and social risk and impact management, grievance redress mechanisms, and monitoring, reporting and evaluation.

37. **Sub-component 4.2: Project Management, Coordination, Monitoring and Evaluation under MAFF (US$ 2 million IDA and US$2 million from RGC).** This subcomponent provides technical and operational support for the implementation of MAFF's Respective Part of the Project, including: project management and coordination, including financial management and disbursement, procurement, environmental and social risk and impact management, grievance redress mechanisms, and monitoring, reporting and evaluation.

38. **Component 5: Contingent Emergency Response Component (CERC) (US$0).** This zero-dollar component will provide immediate response to an eligible crisis or emergency, as needed. A contingent emergency response component (CERC) manual will be prepared as an annex to the Project Operations Manual (POM), which factors in climate risks on both climate change mitigation and adaptation as well as specifies implementation arrangements, including its activation process, the roles and responsibilities of implementing agencies (IAs), the positive list of activities that may be financed, Environmental and Social (E&S) aspects, and fiduciary arrangements.

### C. Project Beneficiaries

39. The beneficiaries consist of people who will directly benefit from the upgraded infrastructure, the improved water supply services for domestic and agriculture use, the enhanced resilience of livelihoods to climate shocks, and the capacity building under the project. Approximately 113,700 people, 50 percent of whom are female, in the project's area of intervention are expected to directly benefit from the project's investments. Additionally, more than 43,000 people, including small business vendors, fishermen, and other beneficiaries, will indirectly benefit from different aspects of the project. The staff of MOWRAM, MAFF, the PDWRAMs, and PDAFFs will also benefit from the project's capacity building support to improve their O&M performance and overall sector performance in the long run.

40. Women are key beneficiaries. The project will enhance women's water resource management skills and support actions to increase women's representation and participation in water resources management and governance.

### D. Results Chain

41. The project's results chain is presented in Figure 1. The project will address water security by enhancing its resiliency to floods and droughts and improving water resources management for multiple water users, including irrigation services. While the project may not be capable of uniformly addressing all dimensions of water security, it lays the groundwork for adopting an IWRM approach to plan Cambodia's future water resources investments more effectively. Building upon the foundation of upgraded infrastructure, the project will develop institutional, technical, and financial capacity at MOWRAM and MAFF, its provincial departments, the FWUCs and other stakeholder entities to optimize the delivery of water services to female and male farmers while also supporting the adoption of climate-resilient production models to reduce climate risks.

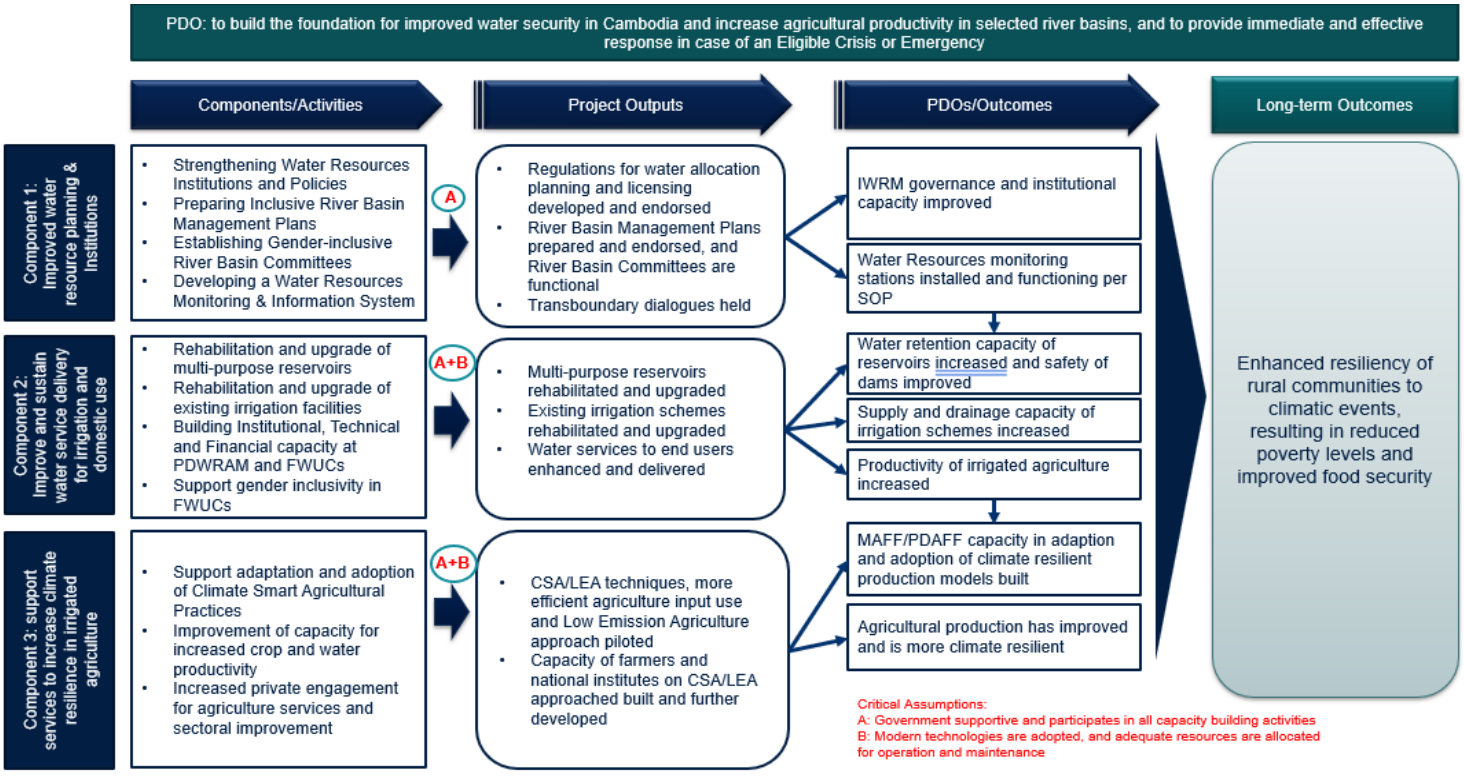



**Figure 1: Theory of Change (TOC)**

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

42. **The project builds on the foundation of the Mekong Integrated Water Resources Management Project Phase III (P148647).** This project laid the foundation for river basin planning, data collection, and management for improved water security and transboundary cooperation for critical river basins in Cambodia. The CaWSIP will build on this foundation to scale up the development of the RBMPs, further enhance transboundary cooperation, and help institutionalize IWRM in Cambodia. CaWSIP would furthermore lay the foundation for dam safety by developing the necessary guidelines and establishing a risk-based approach to dam safety, which is critical in managing water resources and related infrastructure.

43. **The engagement builds on a trusted partnership with the RGC on WRM and agriculture.** The World Bank has a strong partnership with the RGC on both WRM and agriculture and has a long history working with MAFF. This project provides an opportunity to support MOWRAM and MAFF in setting the fundamentals for achieving the Government's IWRM and agriculture agenda. The project is informed by past engagements and will benefit from synergies during implementation with ongoing operations, including the Cambodia Land Allocation for Social and Economic Development Project III (P171331), the Cambodia Agricultural Sector Diversification Project (P163264), and the Water Supply and Sanitation Acceleration Project (P178417). Opportunities for inter-project collaboration were identified and embedded in the project design.

44. **The World Bank can play an important role through its convening power in bringing together relevant government entities, development partners, and other stakeholders.** This can be achieved by making use of established

coordination platforms, such as the Technical Working Group on Agriculture and Water (TWG-AW)[12] and the Development Partner Coordination Group for the Water Resources Sector. These platforms provide a venue for pertinent government agencies, development partners, and community representatives to engage in dialogue and collaborate effectively. Since 2010, over $830 million has been invested by development partners including Asian Development Bank (ADB), Japan International Cooperation Agency (JICA), Agence Française de Développement (AFD), Korea International Cooperation Agency (KOICA), Department of Foreign Affairs and Trade (DFAT) of the Australian Embassy and other agencies in water resources and irrigation projects, with a primary focus on physical infrastructure like the rehabilitation and construction of new irrigation systems. However, investment in non-physical aspects such as regulatory enforcement, strategic planning, and service optimization has been limited. Despite advancements, there remains a significant gap in areas like regulation, institutional capacity, sustainable operations and maintenance, and resilient crop productivity. The World Bank is well-positioned to support the MOWRAM and MAFF in collaboration with development partners in strengthening sectoral coordination and institutional capacity, improving regulatory framework on water resource management, and improving water service delivery for domestic water supply and irrigation.

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

45. **Lessons learned from reviews of other WRM and irrigated agriculture operations[13] from the World Bank and other development partners as well as applicable international good practices have been considered in the project design to ensure effective and efficient project implementation and successful outcomes.** Three inter-related lessons have informed the design of the project and highlight the need to address the system as a whole, including working with stakeholders across government and at the community level:

(a) **Water security is a cross-cutting theme and requires a multisectoral and integrated approach**. The project is designed in a way that facilitates maximum interaction between implementing agencies at a national and provincial level, recognizing the need to integrate various users when planning, designing, and implementing water resources strategies, and built infrastructure. Comprehensive stakeholder engagement has been embedded as part of the development of RBMPs, ensuring that all water users are included in the planning processes, and various concerns and priorities are factored in.

(b) **Poor irrigation services, low-cost recovery, and deferred infrastructure maintenance result to a large extent, from the vicious cycle of low farm revenue, inadequate water tariffs, and a lack of service provision.** The lessons learned from ongoing and past engagements illustrate the importance of the link between sustainable financing, irrigation services and farming systems. The project recognizes the important role of the PDWRAM and FWUCs in providing last-mile irrigation services to farmers, and the fact that these entities require strengthened institutional, technical, and financial capacity to effectively fulfill their tasks. Subcomponent 2.3 of the project is dedicated to developing these services through a comprehensive technical assistance program that addresses all aspects of water service delivery in a practical, sustainable and coordinated manner.

(c) **Strong inter-ministerial coordination on a national and provincial level is key for achieving project results.** Addressing water security on a national level requires strong collaboration and cooperation between various ministries, including MOWRAM, MAFF, MISTI, MOE, and the CNMC. To ensure strong coordination, these ministries will form part of the Project Steering Committee (PSC), which will provide sectoral direction, planning, and guidance to the Project Management Unit (PMU) and Project Implementing Units (PIUs). At the

[12] The TWG-AW was established by the RGC to support a coordinated approach between MOWRAM and MAFF for addressing water resources development and agriculture objectives.

[13] Similar projects include: India: P174593, Assam Integrated River Basin Management Project; Viet Nam: P130014 - Viet Nam Irrigated Agriculture Project; and Cambodia: P148647 - Mekong Integrated Water Resources Management Phase III Project.

subnational level, RBCs will provide a platform for line departments to collaborate, communicate, and advance the water resources agenda. To facilitate smooth collaboration and overcome the budgetary issues identified in previous operations, the project includes grant financing to the PDWRAMs for the implementation of specific activities under the project.

## III. IMPLEMENTATION ARRANGEMENTS

### A. Institutional and Implementation Arrangements

46. **MOWRAM has established a PMU for the implementation of Components 1 and 2. MAFF has established one PIU for the implementation of Component 3.** For Component 2, a Project Implementation Team in each PDWRAM has been established to implement Subcomponent 2.3. MOWRAM will also serve as the central PMU and will lead implementation of Component 4. The PSC will be responsible for overall project oversight; the PSC will be established jointly by MOWRAM, MAFF, MISTI, MOE, CNMC, and the Ministry of Economy and Finance (MEF). The PSC will be chaired by MOWRAM's Secretary of State. During project implementation, the PMU and PIU will engage relevant technical departments and will gradually hand over their responsibilities to the line departments of the ministries and relevant government agencies during the implementation and after the project closing. The responsibilities of the PMU and PIU will be specified in the POM and are further detailed in Annex 1. The implementation arrangements for Component 5 (CERC) will be specified in the CERC Manual.

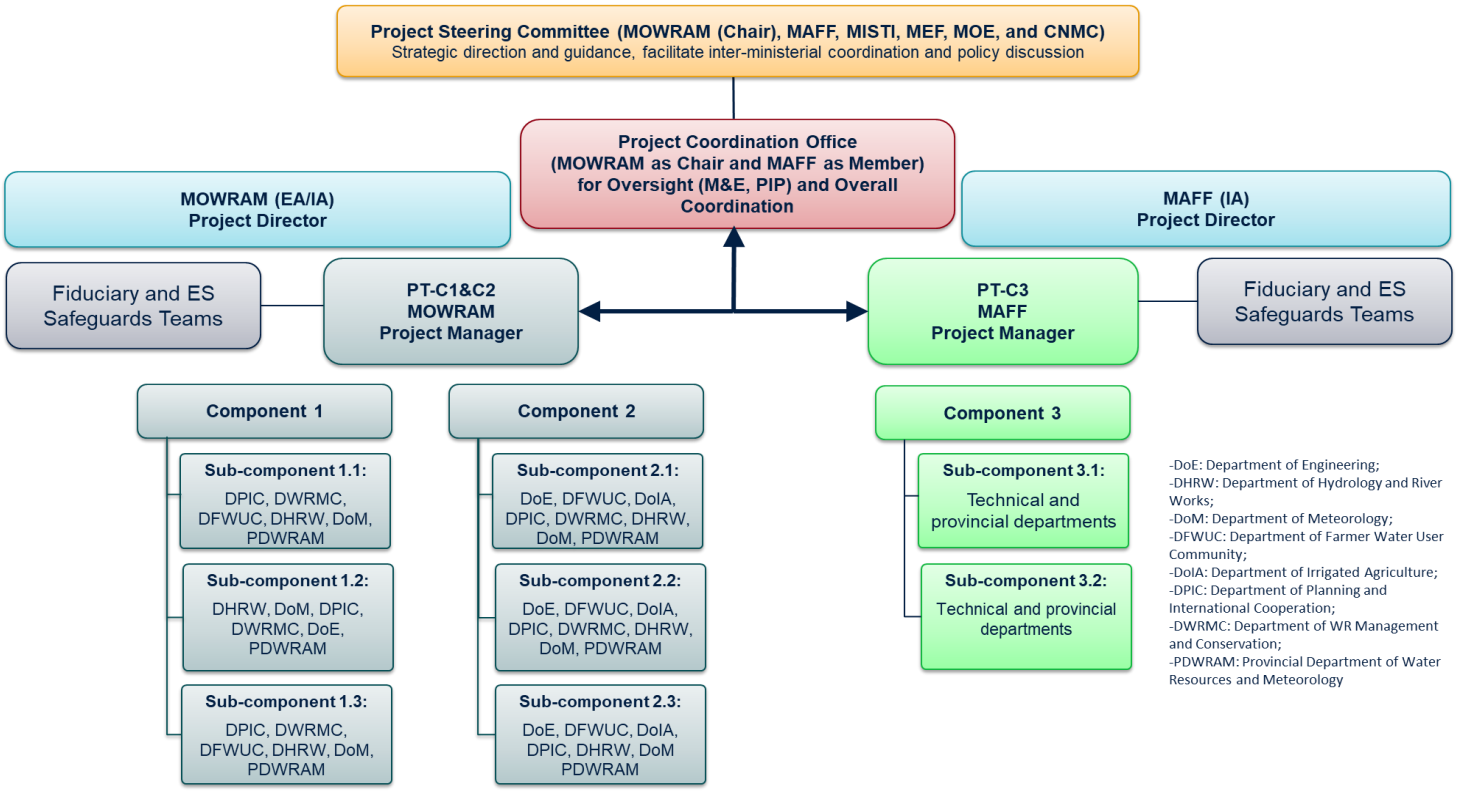



**Figure 2. Project Implementation Structure**

47. **The project will engage a pool of experts to build capacity and support the Government at all levels of implementation.** To build ownership and capacity to implement the project, the project will capitalize on the Government's institutional structure and provide hands-on implementation support throughout the project implementation period. Given low client capacity, the project will engage expert advisors to support the PIUs with technical, procurement, gender, financial management (FM), and E&S safeguards issues. Each advisor will have a counterpart at the PIU (or team of experts) to work with on day-to-day activities (for example, preparing high-quality terms of references (TORs) and assisting with procurement) to build capacity on the job. This arrangement was piloted in other World Bank operations and has proven to yield cumulative advantages over the hiring of individual consultants for each sub-activity, particularly in terms of commitment, coordination, and leveraging the benefits of building a trusted relationship between the PIUs and their advisers.

### B. Results Monitoring and Evaluation Arrangements

48. **Results framework and monitoring.** A comprehensive Results Monitoring Framework (RMF), including targets and definitions, has been prepared and is included in the POM. The RMF is based on the ToC and describes the PDO-level indicators and the component-specific intermediate-level indicators. MOWRAM and MAFF will be responsible for monitoring implementation progress, monitoring progress toward achieving the PDO for their respective components, and for coordinating the preparation of required biannual project progress reports. At the time of the mid-term review, the project will reassess the specific target values for the PDO indicators and outcomes of related intermediate results indicators based on progress made at that time.

49. **Monitoring and evaluation (M&E) design.** A baseline survey will be undertaken within the first six months of project implementation to establish and/or update data and information on the socio-economic, water service delivery and productivity statistics for the project sites. This information will be supplemented with the existing data and information provided by the PMU and PIUs. Detailed data will be added to a database when new sites/subprojects enter the project. The project M&E system will also cover: (a) implementation progress, including physical and financial status and(b) achievement of intermediate and PDO outcome indicators as specified in the RMF. Throughout project implementation, efforts will be made to seek feedback on project activities. Project management will also monitor progress on coordination with other World Bank ongoing projects, transboundary cooperation, gender inclusivity targets and climate change impacts.

### C. Sustainability

50. **Project sustainability.** To achieve effective functioning of the FWUCs in providing water services to end users, the project identified three key sustainability risks that will be addressed under the project, namely: (a) institutional capacity; (b) technical capacity; and (c) financial capacity of the FWUCs:

(a) **Sustainability of institutions.** National policies and legislation will be reviewed to facilitate the professionalization of the FWUCs to enable them to undertake O&M functions and support the PDWRAMs to assist the FWUCs where needed.

(b) **Strengthening technical capacity and innovations.** O&M manuals will be prepared under the project to support FWUCs in their role as service providers. These manuals include the use of automated monitoring systems for operating the irrigation system and making use of MOWRAM's hydro-met network to monitor water availability.

(c) **Sustainability of financing.** The O&M of structures financed through the project will mostly be embedded in civil works contracts that will include training for the PDWRAMs and FWUCs. O&M will be fully handed over to infrastructure owners and/or users on average three years after the completion of construction. The project will support MOWRAM in preparing an O&M Recovery Plan that captures the operational and financial arrangements for O&M of infrastructure supported under the project in order to ensure the sustainability of project investments. The fee structure (for cost recovery) will consider various mechanisms, such as quotas-based charge, volumetric metering, and other mechanisms given that this incentivizes water use efficiency, willingness to pay, and improved farmers' participation. To this end, the project will professionalize the FWUCs so that they: (a) can adopt a sustainable management structure; (b) have knowledge of financial planning; and (c) can operate a fee management and accounting system that includes fee setting, fee collection, and bookkeeping.

## IV. PROJECT APPRAISAL SUMMARY

### A. Technical and Economic Analysis

51. **Technical analysis.** The project's three main components and activities were developed through extensive consultation with MOWRAM, MAFF, and other relevant stakeholders. The components follow a logical sequence and are strategically interconnected. The planning, design, and construction of strategic water resources infrastructure investments follows a phased approach. Phase 1 investments concern rehabilitation works and water service delivery for two specific subprojects (Svay Chrum and Srey Huy) and include the rehabilitation of infrastructure that will increase the total storage capacity of multipurpose reservoirs from an existing 5.77 million $m^3$ to 9.78 million $m^3$. In conjunction with

the capacity increase of the reservoirs and rehabilitation of irrigation systems, the total irrigated area will increase from 1,574 ha to 8,350 ha (of 4,400 ha command area). The first round of civil works is expected to cost US$45 million (see Annex 2 for subproject specific information). Feasibility studies, along with E&S assessments and preliminary detailed engineering designs, were completed during the project's preparation phase. This allows the execution of these investments to start immediately after effectiveness and be completed in the first three years of project implementation. Finally, the project will be piloting innovative technologies to reduce methane emissions from rice production, including AWD, in the early wet season. During the implementation, the project will be conducting an economic analysis to understand the economic benefits of AWD, to inform how future investment in irrigation and drainage could lead to improved water productivity, and climate change adaptation and mitigation.

52. **Feasibility studies for additional subprojects will be prepared.** Additional subprojects will be identified and selected in year one to conduct feasibility studies and detailed engineering designs and actual construction of the sub-projects will be started in year three of the projects and focus on major river basins, namely Staung, 3S, and 5P river basins. Investments for two more subprojects will be identified in accordance with the RBMPs that are expected to be ready in year three of the project.

53. **The World Bank will provide added value on establishing an institutional strengthening agenda for sustainable water service delivery.** The World Bank will mobilize its global knowledge to offer innovative and successful practices to improve sector governance and performance. Throughout project implementation, the World Bank will capitalize on global tools, such as the Irrigation of the Future tool and the Farmer Led Irrigation Development tool to help nurture performance improvement of irrigation services. The tools will guide Cambodia to better water and crop planning and service delivery, and the Policy, Institution, and Regulation tool will help guide regulatory and policy reform.

54. **The project is aligned with the goals of the Paris Agreement on both mitigation and adaptation.**

55. **Assessment and reduction of mitigation risks**. The project does not pose a material risk of having a negative impact on the country's low-GHG emissions development pathways. Project activities, such as adoption of CSA approaches, including AWD and SRI interventions, adoption of water-saving technologies, and promotion of renewable-based irrigation systems, are universally aligned with the Paris Agreement's mitigation goals. The project incorporates mitigation strategies, including on flood and drought management through the development of RBMPs, directly contributing to Cambodia's NDC goals. The project's interventions are designed following a nature-based approach, which provides a combination of both adaptation and mitigation benefits while also reducing GHG emissions.

56. **Assessment and reduction of adaptation risks.** The results of the climate and disaster risk screening indicate a moderate risk, predominantly related to the occurrence of prolonged periods of drought and flooding due to erratic rainfall. Climate-related risks in the project area will be managed and mitigated through infrastructure investments constructed under the project, such as increasing water storage capacity of reservoirs, factoring in climate variabilities, as well as rehabilitating irrigation facilities that will provide a year-round supply of water to farming communities. A combination of structural, including nature-based solutions, and non-structural adaptation solutions will be implemented where appropriate. Finally, farmers will be trained on the adoption of climate change adaptation measures to manage floods and droughts, mitigating impacts at the farm level. On a sectoral level, the project will systematically address flood and drought risk management by fostering close collaboration between MOWRAM, MAFF, and MISTI to coordinate, plan, and manage water source development while factoring in climate change impacts on all aspects of water security. Thus, through the project, risks from climate hazards will be reduced to an acceptable level and are not likely to have material impact on the project and achievement of its development objective.

57. **Economic analysis.** The economic analysis evaluated the project's developmental impact using a cost-benefit approach. Expected financial and economic benefits encompass improved land and water resource sustainability, enhanced farm productivity and profitability via climate-resilient technologies and reduced net GHG emissions due to better practices. Agricultural gains were projected through representative crop production models and account for improved practices and small-scale irrigation. Project returns were calculated by aggregating benefits, including expansion, stabilization, improved irrigation, modern methods, and road enhancements, over 25 years using a 10 percent discount rate. Unquantified benefits like the impact of water management on intensification and diversification were acknowledged but not measured. Excluding GHG emissions, the economic analysis indicates an 18.2 percent Economic Rate of Return (ERR) and an Equivalent Net Present Value (ENPV) of $145.2 million. Inclusion of GHG emissions[14], at low and at high carbon shadow pricing results in an EIRR of 18.9 percent with an ENPV of $115.0 million and an EIRR of 19.4 percent with an ENPV of $124.0 million, respectively. The sensitivity analysis confirmed the robustness of the ERR across the tested variables[15].

58. **GHG analysis.** A GHG emissions balance was estimated using the EX-Ante Carbon-balance Tool (EX-ACT). The analyses present results of a GHG analysis in tCO2eq (carbon dioxide equivalent) for various cropland management practices over a 20-year period. In the without the project scenario, the net carbon balance for cropland management, including water regime adjustments for flooded rice, is an increase of 231 tCO2eq over the 20-year period, with an annual increase of 12 tCO2eq/yr. In contrast, land use changes result in a reduction of 708.551 tCO2eq over 20 years, with an annual decrease of 35,428 tCO2eq/yr. Additionally, the use of all fertilizers leads to a net increase of 33,371 tCO2eq over 20 years, with an annual increase of 1,669 tCO2eq/yr. The application of pesticides contributes to a net increase of 3,435 tCO2eq over 20 years, with an annual increase of 172 tCO2eq/yr. In aggregation, the analysis demonstrated a reduction of 671,745 tCO2eq over 20 years, with an annual decrease of 33,576 tCO2eq/yr.

59. **Citizen Engagement.** Social inclusion, gender, farmer, and community participation are a key part of project activities. An enhanced community and stakeholder engagement process will be implemented for all site-specific project activities, such as the preparation of RBMPs and preparation of engineering designs for sub-projects. Special attention will be given to raise awareness among vulnerable groups, such as indigenous peoples/ethnic minorities, elderly, women, and persons with disabilities, to participate in consultations and decisions. Since the project will work with farmers and community leaders, the participatory approaches under the IWRM principle will be applied to ensure access to information, transparency, and consultation with relevant stakeholders in planning and decision-making processes.

60. **The project will rely on two participatory mechanisms to enable water users to engage in decision making:** (a) the project will establish RBCs, composed of provincial governors, deputy governors, directors of the PDWRAMs, CNMC representatives, relevant line provincial department representatives, and other concerned local authorities. RBCs will be engaged in developing RBMPs for two sub-basins; and (b) the project will establish new or strengthen existing FWUCs, with adequate staff composed of farmer representatives, local authorities, and the private sector. The FWUCs will be responsible for managing, operating, and maintaining water service delivery systems in an effective manner. The project will build the institutional, technical, and financial capacity of the FWUCs, so they are able to fulfill their roles beyond the life of the project. The project will also seek to build the FWUCs' and PDWRAMs' capacity for citizen engagement and to strengthen their ability to engage with each other. The project will monitor the implementation of these participatory mechanisms through two indicators that monitor the establishment of RBCs and FWUCs. In creating RBCs and FWUCs, the project will promote inclusive participation of various groups, such as indigenous peoples/ethnic minorities.

[14] Guidance note on shadow price of carbon in economic analysis. World Bank, September 2017

[15] Economic analysis note available upon request

61. **Gender.** The gender analysis (see Annex 3) revealed that both men and women have different needs and preferences for water use, but women's views are not often considered given that they are usually not in decision making roles. The project seeks to improve women's representation in water governing bodies, by: (a) providing dedicated and trained gender staff and building national agencies' and local organizations' capacity on gender; (b) tailoring training sessions for FWUCs and RBCs to suit the needs and schedules of women as well as men, in order to support women's enhanced skills and capacity for effective participation; (c) reviewing FWUCs and RBCs selection process to facilitate female participation and representation in key decision-making/ leadership roles; and (d) exploring the possibility of establishing national and local coordination mechanisms on gender in the water resource sector. In line with the project requisites, at least 30 percent of members of project-supported RBCs and FWUCs must be women and at least two women must be in leadership roles in each governing body.

## B. Fiduciary

### (i) Financial Management

62. MOWRAM and MAFF FM and accountability arrangements for the project meet the World Bank's minimum requirements, in line with the Bank Policy and the Bank Directive for Investment Project Financing (IPF guidance dated December 2021), subject to the implementation of the following risk mitigation measures: (a) assigning experienced FM staff; (b) recruiting local FM specialists; (c) installing computerized accounting software; and (d) putting in place a clear set of internal control procedures/FM manuals in line with the Cash Basis of Cambodian Public Sector Accounting Standard (CPSAS). The residual FM risk at project preparation is rated Substantial after incorporating the proposed mitigation measures.

63. The FM arrangements will be embedded in the existing structures of MOWRAM and MAFF in compliance with the standard operating procedure (SOP)/Financial Management Manual (FMM) for all externally financed projects and programs issued by the MEF in line with Sub-Decree No. 181 ANK/BK, dated December 02, 2019. MOWRAM's Department of Finance reports to the General Directorate of Administration and Finance and focuses on the governance and application of public funds. MOWRAM is the PMU and will be responsible for FM implementation for Components 1 and 2 and Subcomponent 4.1. The FM unit of the MAFF/GDA will have the overall fiduciary responsibility for Component 3 and Subcomponent 4.2. The project has acceptable FM arrangements to account for and report on project expenditures, including: (a) use of funds in an efficient and economical manner for the purposes intended; (b) preparation of accurate and reliable periodic financial reports; and (c) acceptable audit/assurance arrangements.

64. The project's financial reports and audited financial statements will be furnished to the World Bank in a timely manner. A six-month interim unaudited financial report will be submitted to the World Bank no later than 45 days after the end of each semester. The project shall have its financial statements audited annually by an external auditor, who will be appointed by the MEF. Each audit will cover one calendar year, and the audit report for each year will be submitted to the World Bank no later than six months after the year-end. Further details on the project's FM and disbursement arrangements can be found in Annex 1 and the POM.

### (ii) Procurement

65. **Applicable procurement rules and procedures.** Procurement under the project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers, Fifth Edition, September 2023 and the provisions stipulated in the Financing Agreement. The approaches to national markets (National Procurement and Request for Quotations) will apply in accordance with the Kingdom of Cambodia's Updated Standard Operating Procedures and

Procurement Manual for All Externally Financed Projects/Programs (Procurement Manual), dated December 2, 2019, subject to any additional provisions included in the Procurement Plan. The World Bank web-based tool (Systematic Tracking of Exchanges in Procurement, STEP) will be used to prepare, clear, and update the Procurement Plans and to conduct all procurement transactions for the project, including contract management.

66. **Procurement arrangements.** MOWRAM and MAFF, supported by individual procurement consultant(s), will carry out procurement activities under their respective components. A Project Procurement Strategy for Development (PPSD) and an initial 18-month Procurement Plan have been prepared. The World Bank team has conducted a procurement risk assessment for the project and identified the key risks. The assigned procurement team from MOWRAM and MAFF have had some exposure to the Asian Development Bank and World Bank procurement processes from previous projects but have limited practical experience in implementing procurement as it has been carried out by procurement consultants. The overall project procurement risk is rated Substantial after having incorporated the proposed mitigation measures. The key procurement risks and proposed mitigation measures as well as detailed procurement arrangements can be found in Annex 1.

### C. Legal Operational Policies

| Legal Operational Policies | Triggered? |
|---|---|
| Projects on International Waterways OP 7.50 | Yes |
| Projects in Disputed Area OP 7.60 | No |

67. **The policy on Projects on International Waterways is triggered.** The project triggers the application of the Operational Policy (OP) 7.50 concerning Projects on International Waterways because the project finances activities that will use the water of tributaries of the Mekong River, which are considered international waterways according to the Policy. Accordingly, the project was notified to the other riparian countries. There was no-objection raised to the project. The proposed investments will not adversely affect the flow, quantity, or quality of the waters of the Mekong River system to and in other riparian countries. The World Bank Regional Vice President's approval to proceed with finalizing project preparation was obtained on February 7, 2024.

### D. Environmental and Social

68. **The overall E&S risk is considered Substantial.** The environmental risk rating is considered **Substantial** mainly due to limited capacity of MOWRAM in managing E&S risks and impacts of projects with other development partners, and MOWRAM's past experience in implementing E&S due diligence tasks related to the Environmental and Social Framework (ESF) and safeguard policies, particularly in managing dam safety risks. Project activities and investments are unlikely to result in irreversible environmental impacts. Risks and impacts are mostly temporary, predictable and mitigation measures are known. The nature and magnitude of potential impacts are limited to:

(a) **dam safety:** based on the available information on the size of the dams and consequence level as well as potential operational issues, an initial assessment indicated that the safety risk of the Svay Chrum and the Srae Huy dams is considered substantial;

(b) **construction related impacts**, which include waste generation, noise and vibration, pollution to receiving water bodies, and occupational health and safety. Potential impacts are temporary, predictable, and reversible. Mitigation measures are readily available and reliable. Environmental risks from construction activities will be mitigated through the implementation of site specific Environmental and Social Management Plans (ESMPs); and

(c) **indirect impacts on critical habitat** qualifying bird species from development of the Svay Chrum reservoir: These birds are vulnerable to an ongoing illegal wildlife trade (IWT) and may be impacted indirectly by construction-related disturbance and net gain measures are therefore applicable. The ESMP for Svay Chrum has been prepared to address construction-related impacts and net gain can be achieved by applying the World Bank Good Practice Note (GPN) on "Reducing Illegal Trade of Biodiversity and Living Natural Resources." A dedicated Biodiversity Action Plan (BAP) will be developed for the reservoir where impacts are expected on the bird species. The Environmental and Social Commitment Plan (ESCP) has included a provision for this measure.

69. **The social risk rating is considered Substantial related to:** (a) potential land acquisition for rehabilitation and construction of irrigation infrastructure; (b) ensuring equal access to project benefits for poor, marginalized farmers; (c) impacts on livelihood activities and cultural properties of indigenous peoples; and (d) the labor influx due to potential involvement of outside labor force for construction works. The Sexual Exploration and Abuse/Sexual Harassment (SEA/SH) risk is classified as Moderate as the project is unlikely to involve a large number of foreign workers for civil works, and contracted workers are expected to be hired from local areas.

70. **The E&S risks of the project have been assessed and consultations with key stakeholders were carried during project preparation**. Nine Environmental and Social Standards (ESS) are assessed as relevant: ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS7, ESS8 and ESS10 in addition to OP7.50 (international waterways). The overall E&S impacts of the project are expected to be positive. The E&S risks/impacts will be managed using the following instruments, an ESMF, Resettlement Policy Framework (RPF), an Indigenous Peoples Planning Framework (IPPF), a Stakeholder Engagement Plan (SEP) including a project Grievance Redress Mechanism (GRM), Labor Management Procedures (LMP) and two site specific ESMPs for the first year of project implementation. In addition, the CERC ESMF will be prepared in Year 1 of project implementation, and to be disclosed, consulted, and adopted by the MOWRAM and MAFF and implement throughout project implementation. The client also prepared an ESCP that outlines all the due diligence requirements and activities to be implemented during the project.

71. **Resettlement impacts will require special attention during implementation given the uncertainty of the affected households for undefined interventions.** All ESF instruments have been disclosed in-country by MOWRAM and MAFF on their respective websites, and on the World Bank's external website on March 27, 2024. More details can be found in Annex 1 and the POM.

## V. GRIEVANCE REDRESS SERVICES

72. **Grievance redress mechanism.** While a project centered GRM will be established by MORWAM, in collaboration with MAFF to receive feedback from project stakeholders, communities and individuals who believe that they are adversely affected by a project supported by the World Bank may also submit complaints to the Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank non-compliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity 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 GRS, please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank's Accountability Mechanism, please visit https://accountability.worldbank.org.

## VI. KEY RISKS

73. **The institutional capacity risk for implementation is rated Substantial.** MOWRAM and MAFF have recent experience implementing World Bank-funded and other development partner-funded projects. The PDWRAMs and PDAFFs, however, have little experience implementing externally funded projects, and the capacity for implementing the project at the subnational level is limited. To mitigate this capacity risk, the project will provide intensive implementation support to both MOWRAM/MAFF and PDWRAM/PDAFF staff on various topics, including FM and procurement training, technical support, and M&E support, dedicated project management component and detailed manuals for key activities. A pool of experts will be contracted to provide project management and technical support.

74. **The fiduciary risk is rated Substantial for both FM and procurement.** This is primarily due to the FM and procurement capacity of staff, the implementation of the CPSAS, and internal control systems and covenants requirements. The involvement of the Internal Audit Department of MOWRAM and MAFF to carry out the project audit will strengthen and improve internal control systems. The project will include FM capacity building and development of relevant structures in MOWRAM and MAFF and promote the use of the national system. For procurement, risks are mainly associated with the limited procurement capacity of the assigned procurement team and weak coordination between the procurement and technical departments for obtaining technical input. The PIUs, MOWRAM and MAFF staff, and key consultants involved in decision-making, procurement, and FM processes will be required to sign a statement confirming that they: (a) are fully aware of the World Bank's Anti-Corruption Guidelines and requirements; and (b) will inform the World Bank about their potential conflict of interest associated with a particular bidding procedure as well as any fraud and corruption issue that may come to their attention. The details of the identified risks and proposed risk mitigation measures are presented in Annex 1.

75. **The overall E&S risk is Substantial.** Physical works under the project, including rehabilitation of multipurpose dams and irrigation systems, generate typical—often temporary—construction-related environmental impacts. Key environmental risks largely involve potential impacts on biodiversity and dam safety in two selected sub-projects that can be mitigated through site-specific ESMPs. Social risks relate to potential land acquisition or temporary loss of livelihood due to construction activities; these risks are addressed through well-developed RAPs. Ensuring social inclusion and participatory approaches are important but challenging elements in the project; the risks are mitigated through a comprehensive Stakeholder Engagement Plan (SEP) and robust communication and GRM programs.

76. **The stakeholder risk is rated Substantial.** Building the foundation for IWRM in Cambodia is a complex and long-term process. In addition, the project is ambitious in its objective to also increase agriculture productivity through improved water service delivery. Stakeholder groups may have unrealistic and different expectations about what can be accomplished under the project. These risks will be mitigated through civil society engagement activities and through a strategic communication program that seeks to understand the perspectives of different stakeholders and communicates the scope of the project.

77. **The project received strong support during the extensive consultations with development partners and other stakeholders at the national and subnational levels during preparation.** During implementation, the project needs to continue engaging and consulting development partners and civil society organizations to avoid any misleading

information or complaints made from indigenous groups or environmental activists working in the project areas. To mitigate the reputational risk, the project will use various coordination mechanisms at the national and subnational levels to inform and receive feedback from relevant stakeholders and affected people. It will consult civil society organizations, national and international nongovernmental organizations, and development partners to ensure that the project activities are aligned with the Government's development program and avoid overlap. The project will also conduct communication campaigns and support knowledge sharing and exchanges, working collectively with the stakeholders at all levels to build trust, support institutional and policy reform, and ensure transparency in all forms and processes. The project will follow the SEP and, where deemed necessary, further stakeholder consultations will be carried out.

78. **The overall risk rating for the project is determined to be Substantial** largely because of weak institutional capacity, fiduciary risks, E&S, and stakeholder aspects that may potentially affect achievement of the PDO.

## VII. RESULTS FRAMEWORK AND MONITORING

### PDO Indicators by PDO Outcomes

| Baseline | Period 1 | Period 2 | Period 3 | Period 4 | Period 5 | Closing Period |
|---|---|---|---|---|---|---|
| **To build the foundation for improved water security and increase agricultural productivity** | | | | | | |
| **Climate-informed River Basin Management Plans for selected basins prepared and endorsed (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 0 | 1 | 2 | 3 | 3 |
| **People benefitting from improved water service delivery (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 0 | 7500 | 35000 | 75000 | 113700 |
| **Increased crop productivity (Percentage)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 5 | 10 | 15 | 20 | 20 |

### Intermediate Indicators by Components

| Baseline | Period 1 | Period 2 | Period 3 | Period 4 | Period 5 | Closing Period |
|---|---|---|---|---|---|---|
| **Component 1: Improve water resources planning and institutions.** | | | | | | |
| **Water Resources monitoring stations installed and functioning per SOP (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 2 | 3 | 4 | 5 | 5 |
| **Government staff trained in IWRM, water service delivery and O&M (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 30 | 50 | 70 | 80 | 100 | 150 |
| **Policies on IWRM and irrigation water service delivery prepared and endorsed by MOWRAM. (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 0 | 1 | 2 | 3 | 3 |
| **River Basin Committees (RBC) established and operational, with at least 30% women participation and 2 women in a decision making role. (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 2 | 3 | 3 | 3 |
| **Component 2: Improve and sustain water service delivery for irrigation and domestic use.** | | | | | | |
| **Retention capacity of multi-purpose reservoirs increased in drought-prone areas (Cubic Meter(m3))** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 0 | 10,000,000 | 16,000,000 | 40,000,000 | 40,000,000 |
| **Area provided with new/improved irrigation or drainage services (Hectare(Ha))** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0.00 | 0.00 | 1600 | 6600 | 10500 | 15000 | 24000 |
| **Operating procedures (O&M-manual) for improved water service delivery prepared and approved by MOWRAM (Yes/No)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| No | No | Yes | Yes | Yes | Yes | Yes |
| **Millions of people with enhanced resilience to climate risks (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 0 | 50,000 | 70,000 | 100,000 | 130,000 | 156,700 |
| **FWUCs installed and operational with at least 30% female members, and two women in decision- making roles (Number) (Yes/No)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| No | No | No | Yes | yes | Yes | Yes |
| **Component 3: Support services to increase climate resilience in irrigated agriculture.** | | | | | | |
| **CSA techniques and crop varieties piloted (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 1 | 1 | 3 | 4 | 5 | 5 |
| **MAFF/PDAFF staff trained in adoption of climate resilient production models, of which a minimum of 30% women (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 20 | 50 | 60 | 70 | 90 | 100 |
| **Workshops/networking events for private sector engagement in irrigated agriculture organized (Number)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| 0 | 2 | 4 | 6 | 8 | 10 | 11 |
| **Component 4: Project management, coordination, and monitoring and evaluation.** | | | | | | |
| **Timely submission of progress reports and audit reports (Yes/No)** | | | | | | |
| Jun/2024 | Jun/2025 | Jun/2026 | Jun/2027 | Jun/2028 | Jun/2029 | Jun/2030 |
| No | Yes | Yes | Yes | Yes | Yes | Yes |
| **Component 5: Contingent emergency response.** | | | | | | |

| Improve water security and increase agricultural water productivity | |
|---|---|
| **Climate-informed River Basin Management Plans for selected basins prepared and endorsed (Number)** | |
| Description | The indicator measures the number of River Basin Management Plans (RBMPs) that consider climate change impacts (floods and droughts) that are prepared and endorsed. The project will support the preparation of these RBMPs for Srepok, Prek Te and river basin(s) selected among the 3S and 5P basins in the first year of implementation. "Endorsement" by MoWRAM is defined as achievement of the RBMP preparation which will be officiallly endosed for the implementation. The RBMP refers to the plans and associated process, including establishing RBCs, stakeholder engagement process and other institutional reforms required for effective implementation of the plans going forward. |
| Frequency | Annual |
| Data source | Mid-term review report |
| Methodology for Data Collection | The data will be collected based on achievements of intermedate indicators to be monitored and assessed during the mid-term review. In addition, progress will be tracked through the bi-annual progress reports. |
| Responsibility for Data Collection | MOWRAM |
| **People benefitting from improved water service delivery (Number)** | |
| Description | This indicator measures the number of people benefitting from the project-related interventions (gender disaggregated) against the baseline. The number of people is calculated by the total command area receiving additional water services through project interventions, divided by 1.6 ha* per household, assuming four people per household. |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Annual progress report and data as well as annual surveys |
| Responsibility for Data Collection | MOWRAM/MAFF |
| **Increased crop productivity (Percentage)** | |
| Description | This indicator measures increased yields [metric tons/ha] of major crops in the project area, disaggregated by crop type (volume and value). |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Field surveys complemented with remote sensing observations |
| Responsibility for Data Collection | MAFF/MOWRAM |

## Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

## Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

| Component 1: Improve Water Resources Planning and Institutions | |
|---|---|
| **Water Resources monitoring stations installed and functioning per SOP (Number)** | |
| Description | The SOP is defined as the operating rules as per Operation & Maintenance (O&M) manual.<br>This indicator measures the number of stations that have been installed, made operational,<br>and for which data is automatically transferred to a central database. |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data | Routine data and reporting from data management platform |

| | |
|---|---|
| Collection | |
| Responsibility for Data Collection | MOWRAM |
| **Government staff trained in IWRM, water service delivery and O&M (Number)** | |
| Description | This indicator measures the number of people who have received O&M training provided under the project. |
| Frequency | Annual |
| Data source | Project Progress Report |
| Methodology for Data Collection | Training records (list of participants) will be adminstered. Data will be further confirmed with a list of people who have successfully completed the training that will be submitted to government officials |
| Responsibility for Data Collection | MOWRAM/MAFF |
| **Policies on IWRM and irrigation water service delivery prepared and endorsed by MOWRAM (Number)** | |
| Description | This indicator measures the number of policies that have been revised under the project and adopted by MoWRAM. It concerns at least three regulations to enhance inter-sectoral collaboration and planning regarding IWRM, water allocation and sharing arrangements or equivalent. |
| Frequency | Annual |
| Data source | Project Progress Report |
| Methodology for Data Collection | Project reports complemented with letters of endorsement |
| Responsibility for Data Collection | MOWRAM |
| **River Basin Committees (RBC) established and operational, with at least 30% female members and two women in a decision making role (Number)** | |
| Description | This indicator is measured through the completion of an annual report demonstrating the performance of the RBC the previous year. The mandate of the RBCs in coordinating the management of water resources in targeted river basins will be captured in regulations to be prepared and endorsed by MOWRAM. Gender disaggregated: Measured as the percentage of women in RBCs, including in decision-making positions in each RBC. |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Measured through the completion of an annual report demonstrating the performance of the RBC the previous year |
| Responsibility for Data Collection | MOWRAM |
| **Component 2: Improve and Sustain Water Service Delivery for irrigation and domestic use** | |
| **Retention capacity of multi-purpose reservoirs increased in drought-prone areas (Cubic Meter ($m^3$))** | |
| Description | This indicator is measured as increased reservoir capacity in drought-prone areas, calculated in $m^3$. The increased water retention capacity will serve for multi-purpose uses, flood risk mitigation, and risk management of failure, directly contributing to climate adaptation and resilience. |
| Frequency | Annual |
| Data source | Project reports |
| Methodology for Data Collection | Project reporting with field observations |
| Responsibility for Data Collection | MOWRAM |
| **Area provided with new/improved irrigation or drainage services (Hectare(Ha))** CRI | |
| Description | This indicator measures the total area of land provided with irrigation and drainage services under the project, including in: (a) the area provided with new irrigation and drainage services; and (b) the area provided with improved irrigation and drainage services, expressed in hectares (ha). |
| Frequency | Annual |

| | |
|---|---|
| Data source | Project reports |
| Methodology for Data Collection | Project reporting with field observations during implemenation support missions |
| Responsibility for Data Collection | MOWRAM |
| **Operating procedures (O&M manuals) for improved water service delivery prepared and approved by MOWRAM (Yes/No)** | |
| Description | This indicator measures the completion and approval of O&M manuals for each irrigation scheme. The O&M manuals will be adopted as national O&M procedures. |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Implementation Support Missions |
| Responsibility for Data Collection | MOWRAM |
| **FWUCs installed and operational with at least 30% female members, and two women in decision- making roles (Number)** | |
| Description | This indicator measures the number of FWUCs established and functional with two criteria on gender: at least 30 percent of FWUC members are women and two women are in decision-making roles in each FWUC. |
| Frequency | Annual |
| Data source | Project progress report complemented with service agreement between FWUCs and end-users. |
| Methodology for Data Collection | Implementation Support Missions |
| Responsibility for Data Collection | MOWRAM |
| **People with enhanced resilience to climate risks (Number)** | |
| Description | This indicator is measured as the number of people that benefit from climate-related interventions, including improved water service delivery under Component 2, as well as capacity building under Component 1 and 3. This is a result indicator for Outcome Area 5 (green and blue planet and resilient populations) in the new WBG Scorecard. |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Measured through the completion of progress reports and annual reports |
| Responsibility for Data Collection | MOWRAM, MAFF |
| **Component 3: Support Services to increase climate resilience in irrigated agriculture** | |
| **CSA techniques and crop varieties piloted (Number)** | |
| Description | This indicator measures number of CSA techniques and major crop varieties piloted, measured as the total area of irrigated agriculture that have improved CSA models |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Project reporting supported by field observations |
| Responsibility for Data Collection | MAFF |
| **MAFF/PDAFF staff trained on adoption of climate resilient production models (gender disaggregated) (Number)** | |
| Description | This indicator measures the number of MAFF/PDAFF staff trained on adoption of climate resilient production models |
| Frequency | Semi-annual |
| Data source | Project reports complemented with training records (list of participants) |
| Methodology for Data | Project reporting supported by field observations |

| | |
|---|---|
| Collection | |
| Responsibility for Data Collection | MAFF |
| **Workshops/networking events for private sector engagement in irrigated agriculture organized (Number)** | |
| Description | This indicator measures the number of workshops/networking events organized for MAFF, PDAFF, local stakholders, and private sector actors in irrigated agriculture (Number) |
| Frequency | Annual |
| Data source | Project reports |
| Methodology for Data Collection | Project report with events/workshop records (workshop preceeding reports) |
| Responsibility for Data Collection | MAFF |
| **Component 4: Project Management, Coordination, and Monitoring and Evaluation.** | |
| **Timely submission of progress reports and audit reports (Yes/No)** | |
| Description | This indicator measures the timeliness of submission of the reports and aims to ensure adequate allocation of projects funds across project components |
| Frequency | Annual |
| Data source | Project progress report |
| Methodology for Data Collection | Measused through IFRs and audit reports submitted to the World Bank |
| Responsibility for Data Collection | MOWRAM/MAFF |
| **Component 5: Contingent Emergency Response.** | |

## ANNEX 1: Implementation Arrangements and Support Plan

**COUNTRY: Kingdom of Cambodia**
**Cambodia Water Security Improvement Project**

1. The institutional arrangements for implementation will follow the Government's institutional setup. MOWRAM will hold two functions for project implementation: (a) MOWRAM is responsible for overall project management and coordination with related ministries that are represented in the TWG-AW, including coordinating the implementation of Component 4; and (b) as an implementing agency, MOWRAM will be responsible for the implementation of Components 1 and 2. MAFF will be the implementing agency responsible for the implementation of Component 3. MEF will oversee financial services support. A POM has been prepared that will guide overall project implementation and includes a detailed project description with estimated costs, organizational arrangements, RMF, Financial Management Manual (FMM), and Procurement Manual. Figure 2 shows the organogram of the project implementation structure.

2. **Project Management Unit**. A PMU has been constituted within MOWRAM that will be responsible for overseeing, coordinating project activities and implementing Component 1, 2, and 4.1. It consists of dedicated staff for project management, technical aspects, FM, procurement, E&S, and communications in addition to other support staff for project administration, information technology, and human resources.

3. **Project Implementation Unit.** MAFF has established a PIU which is headed by a Component Manager and supported by staff specialized in FM, procurement, and E&S safeguard management for multilateral development projects. MAFF will be responsible for overseeing, coordinating project activities and implementing Component 3 and 4.2. Various units within MAFF will provide technical support to the PIU as appropriate.

4. As necessary, the PMU and PIU teams will be supported by international and local consultants and/or contract staff. The World Bank has had good experience utilizing teams of international advisers for the PMU and PIUs for technically and institutionally complex projects. The project will also allocate budget for a gender coordinator at the project level.

5. **Project Steering Committee (PSC).** Strategic direction and guidance for the management and operation of the project will be provided by a PSC, chaired by MOWRAM and with high-level representatives from MEF and MAFF. various line ministries and relevant stakeholders such as MEF, MAFF, MOE, MISTI, and CNMC.

6. **The PDWRAMs and PDAFFs are responsible for field-level implementation in collaboration with other relevant technical departments at the provincial level.** Provincial technical departments will oversee implementation and have responsibility for routine O&M of built infrastructure. The provincial staff of line departments will ensure coordination at the provincial and district levels and are responsible for most field-level monitoring activities. The main support for the technical assignments will come from the PIUs. They will be supported through technical assistance and capacity strengthening to facilitate smooth project implementation. Further details on the roles and responsibilities of each PIU are elaborated in the POM.

**Table 1.1. Implementation Arrangements Per Component**

| Components | Subcomponents | Activities | Responsibility |
|---|---|---|---|
| **1. Improve Water Resources Planning and Institutions** | 1.1. Strengthening Water Resources Institutions and National policies | • Review and contribute to key legislation and policy documents, including two sub-decrees on water allocation & licensing and water quality to be endorsed;<br>• Preparing guidelines for dam safety practices for the selected sub-projects feeding into a national dam safety framework to be developed under the project. | DPIC, DWRMC, DFWUC, DHRW, DoM, PDWRAM of MOWRAM |
| | 1.2. Water Resources Monitoring and Information | • Upscaling of hydro-met stations for planning and decision making;<br>• Consulting services for establishing and managing databases and to update and calibrate existing hydraulic/hydrological models;<br>• Set up transboundary data sharing arrangements between Cambodia and Viet Nam. | DHRW, DoM, DPIC, DWRMC, DoE, PDWRAM of MOWRAM |
| | 1.3. Strengthening of Basin Governance and Planning | • Preparation of Climate-informed River Basin Management Plans (RBMPs) to serve as a long-term strategy for managing water resources and to guide strategic investments in the basin;<br>• TA for the establishment of RBC;<br>• Development of institutional capacity. | DPIC, DWRMC, DFWUC, DHRW, DoM, PDWRAM of MOWRAM |
| **2. Improve and Sustain Water Service Delivery for Irrigation and Domestic Use** | 2.1. Rehabilitation and Upgrading of Multi-purpose Water Resources Infrastructure | • Rehabilitation of water storage dams and their sustainable operation for bulk water supply. | DoE, DFWUC, DoIA, DPIC, DWRMC, DHRW, DoM, PDWRAM of MOWRAM |
| | 2.2. Rehabilitation and Upgrading of Irrigation Infrastructure | • Modernize irrigation and drainage systems for Svay Chrum and Srae Huy sub.-basins | DoE, DFWUC, DoIA, DPIC, DWRMC, DHRW, DoM, PDWRAM of MOWRAM |
| | 2.3. Improving Institutional, Technical & Financial Capacity of PDWRAMs and Farmer Water Users Communities | • Support institutional, technical & financial capacity of PDWRAMs and FWUCs of the Svay Chrum and Srae Huy irrigation schemes. | DoE, DFWUC, DoIA, DPIC, DHRW, DoM, PDWRAM of MOWRAM |
| **3. Support Services to Increase Climate Resilience in Irrigated Agriculture** | 3.1. Improved Technology Adoption<br>3.2. Improved Service Delivery | • Piloting CSA and LEA practices and techniques at farm level;<br>• Support institutional strengthening and capacity building of the MAFF, provincial departments and local stakeholders;<br>• Piloting E-extension and certification to support adoption of CSA and LEA agriculture practices;<br>• Enhance private and public service delivery engagement functions (extension, skills, technology) for value addition and market linkages. | MAFF's technical departments |
| **4. Project Management, Coordination, and Monitoring and Evaluation** | | • Planning and implementation;<br>• Coordination, including fiduciary, disbursement, environmental, social risk, impact management, and GRM;<br>• MIS;<br>• M&E System. | MOWRAM, MAFF |

### Implementation Support Plan and Resource Requirements

7. The implementation support approach includes the following:

(a) **Technical guidance and supervision.** The focus of engineering and institutional implementation support will be on working closely with: (a) the implementing agencies, participating service providers, and supervision consultants to review and provide technical advice on regulatory framework, technical guidelines, feasibility studies, engineering designs and specifications (including the normal reviews of bidding documents); and (b) the implementing agencies, participating service providers, and supervision consultants to review non-physical and physical works and provide advice on technical issues as they arise. The support to enhance the quality of certain aspects of the project activities provisioned in each component will also be provided by engaging the World Bank's specialists in specific areas, such as water resources management specialists, institution and regulation specialists, dam safety specialist, and other specialists as required. Each implementation support mission will request information about any issues reported concerning possible fraud and corruption and will document these in mission files to share internally with the Integrity Vice Presidency, in line with standard processes and guidelines.

(b) **ESF.** The World Bank's supervision team includes an environmental specialist and a social specialist. The specialists will lead the ESF supervision and monitoring of the project. Specific specialists will be drawn in on a short-term, as-needed basis. The World Bank team will supervise implementation of the ESF instruments and provide guidance to the implementing agencies to address any issue.

8. **Implementation support plan.** The implementation support plan reflects the anticipated skills mix, timing, and resource requirements over the project life. To maintain flexibility, the implementation support plan will be reviewed periodically to ensure that it meets the project's implementation support needs over time. Detailed pool of experts with required skill mix, and the World Bank team's implementation support plan illustrated in Table 1.2 and 1.3.

**Table 1.2: Focus of Implementation Support**

| Time | Areas of Focus | Skills Needed | Resource Estimate | Partner role |
|---|---|---|---|---|
| Year 1-2 | • Institutional capacity building<br>• Feasibility studies and detail engineering design for additional sub-projects<br>• Construction supervision<br>• Policy and regulatory review<br>• River Basin Management<br>• Dam Safety<br>• Climate Smart Agriculture<br>• Fiduciary (FM and procurement) training<br>• ESF training | • Technical support specialists (policy, institutional, regulation, gender, agriculture and engineering)<br>• Procurement<br>• FM<br>• ESF | US$210,000 per year | Coordination for common approaches |

| | | | | |
|---|---|---|---|---|
| Year 3–6 | • Mid-term review at the mid-Year 3<br>• Institutional capacity building<br>• Consultancy and construction supervision<br>• Implementation of scheme operation and maintenance, and water service delivery | • Technical support specialists (policy, institutional, regulation, gender, agriculture and engineering)<br>• Procurement<br>• FM<br>• ESF | US$210,000 per year | Coordination for common approaches<br><br>Consultation and feedback for midterm review |
| Project Closing | Dissemination of the project outcomes, lessons learned and mainstreaming of good | • M&E<br>• Sector technical specialist | US$210,000 | Consultation and feedback |

**Table 1.3. Skills Mix Required**

| Skills Needed | Number of Staff Weeks (per year) | Number of Trips (per year) | Comments |
|---|---|---|---|
| Task team leader | 6 | n.a. | Based in-country |
| Co-task team leaders | 6 | 2 | Based in region |
| Water infrastructure engineer (International) | 5 | 2 | International |
| Water infrastructure engineer (national) | 10 | n.a. | Based in-country |
| Water institution and regulation specialist | 5 | 2 | Based in region |
| Dam Safety specialist (International) | 5 | 2 | Based in region |
| Water resources management specialist | 3 | n.a. | Based in-country |
| Environmental specialist | 2 | 2 | Based in-country/region |
| Social specialist | 2 | 2 | Based in-country/region |
| Gender specialist | 2 | n.a. | Based in-country |
| FM specialist | 3 | n.a. | Based in-country |
| Procurement specialist | 3 | n.a. | Based in-country |
| Communications specialist | 2 | n.a. | Based in-country |
| Operational support | 12 | n.a. | Based in-country |

**B. Financial Management**

9. The Government's Public Financial Management Reform Program is helping to strengthen the country's PFM system. Key PFM-related regulatory tools have been in place since 2010, and the Government has been streamlining FM control processes. Since 2018 the Financial Management Information System (FMIS) has been rolled out to all line ministries and provincial treasuries across the country. In addition, for accounting and reporting, in 2019, the Government adopted the cash basis of Cambodia Public Sector Accounting Standards in accordance with International Public Sector Accounting Standards. As part of efforts to improve governance, the Government continues to place significant emphasis on strengthening the overall public financial management system, internal control systems (including internal audit functions), and the functions of the National Audit Authority (NAA). For the externally funded projects and programs in Cambodia, the Government's SOP/FMM for All Externally Financed Projects/programs issued by Sub-Decree No. 181 ANK.BK dated December 2, 2019, is applied consistently across the portfolio funded by the development partners,

including the World Bank. The project's FM will follow the SOP of the Financial Management Manual for All Externally Financed Projects/Programs for the respective implementing agencies.

10. **A FM assessment was carried out for MOWRAM and MAFF in accordance with the Bank Policy and Bank Directive for the Investment Project Financing updated 2022 and in consideration of the country's public financial management system and SOP/FMM.** The Government's SOP/FMM for All Externally Financed Projects/ Programs issued by Sub-Decree No. 181 ANK.BK dated December 2, 2019 (as the country financial system) will govern the project's FM. The FM and accountability arrangements (planning, budgeting, accounting, internal controls [including internal auditing], funds flow, financial reporting, and external auditing arrangements) for the project has met the World Bank's minimum requirements subject to the implementation the mitigation measures/actions. The ministries will have fiduciary responsibility for their respective components and will apply, to the extent possible, their existing structures/ mechanisms to the project. MOWRAM's Department of Finance will be responsible for fiduciary works for Components 1, 2, and Subcomponent 4.1 of the project. The MAFF will have the overall fiduciary responsibility for Component 3 and Subcomponent 4.2.

11. **The residual FM risk is Substantial**. The FM risks/gap analysis identified in both ministries are primarily related to staff capacity and lack of a financial management information system to meet the project needs and the World Bank's reporting requirements. The main risks relate to: (a) increased workloads due to the volume of financial transactions, the level of accounting and reporting, the volume of payments due to the large number of small contracts spread across various areas, and the volume of agriculture extension activities; (b) the lack of a FM information system that can accommodate financial reporting in compliance with the World Bank requirements; (c) limited experience in development of charts of accounts aligned with the treasury codes and a lack of clear internal control procedures/FM manuals for the cash basis of CPSAS; (d) project implementation delays due to a lack of budget monitoring, unrealized disbursement projections, delays in submission of the annual work plan and budget (AWPB), and contract management; (e) delayed payments to suppliers, contractors, and service providers, and noncompliance with the standard conditions/requirements of the Financing Agreement; (f) preparing the year-end project financial statements for external audits; and (g) limited experience with the implementation of the incentivized institutional capacity-based performance mechanism generating delays in fund flow arrangements and administrative procedural delays in meeting the conditions/requirements for payments and verification.

12. **Key conclusions of the FM risks, mitigation measures, and the target date.** The risks are centered around technical aspects of setting up of the financial system and the need to have better fiduciary knowledge. MOWRAM and MAFF may encounter challenges with delays in starting implementation, planning and budgeting, procurement, and disbursement. The World Bank will support MOWRAM and MAFF to implement front-end activities in key areas, including CPSAS implementation, the FM information system, finance capacity improvement (FM, disbursement), contract management/payments, internal controls, and the timely disbursement of funds from the World Bank. MOWRAM and MAFF agreed to implementation of risk mitigation and FM advance actions.

13. **FM Structures and accountability.** Each PMU/PIU will have technical, operational, and fiduciary staff as well as support from hired national FM consultants. The FM entities of the PMU/PIU will undertake overall FM and disbursement, including payments/contract management and supervision of: (a) Annual Workplan and Budget (AWPB) preparation; (b) funds flow management; (c) accounting and reporting; and (d) internal controls and auditing. Each PMU/PIU's finance officer will be assisted by a project accountant, a finance assistant, and a cashier. Strategically, two national FM specialists will be contracted to assist in setting up the FM systems and transferring skills to the PMU/PIU. Full-time project accountants (an additional two national consultants) will be contracted to reduce the workload.

14. **Planning and budgeting.** The project budget cycle will follow the Government's procedures according to the SOP/FMM for all externally financed projects and programs issued by Sub-Decree No. 181 ANK/BK dated December 2, 2019. Each PIU will prepare its respective AWPB in US dollars for their respective component's expenditures and will submit the AWPBs first to the MEF for approval and then to the World Bank for its no-objection. The Government's counterpart funding will appear in the AWPB. The portfolio-wide issues identified during the Joint Country Portfolio Performance Review 2021–2022 led by the MEF include: (a) budget preparation and submission for approval is not done on time; (b) there is a lack of M&E of budget execution and no catch-up plan in place; and (c) fewer contracts are awarded each year, affecting overall project disbursements and resulting in project implementation delays. The cost tab and detailed project financing plan, which was prepared and agreed on during the preparation mission, can be a guide to devise the AWPB. The interim unaudited financial report (IFR) captures the eligibility of the expenditures claimed under the Statement of Expenditures and the budget performance against the approved AWPB. The budget of the project captures loan investments in infrastructure, the disbursement of funds for goods and services, and agriculture extension activities.

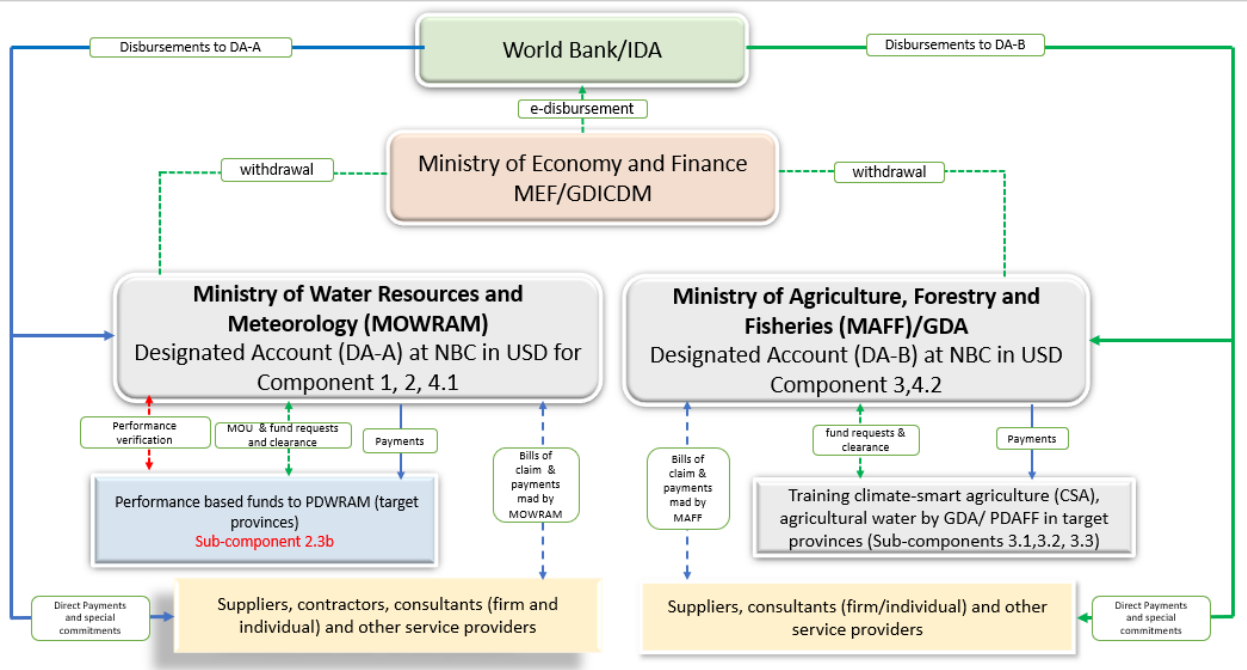
15. **Counterpart funding**. Each PMU will need to open a separate Designated Account (DA)—an advance account in US dollars at the National Bank of Cambodia (NBC) to receive the counterpart funding from the National Treasury. The MEF will make cash contributions to the project, and funding will be allocated to each PMU to cover staff costs for Government personnel who are working on the project, as well as for covering the payments of annual audit fees. The funds will flow at the PMUs' request to the MEF, and the National Treasury will release the payments to the PMUs.

16. **Accounting policies and internal control.** The project will adopt the cash basis of CPAS and follow the chart of accounts of the National Treasury. Computerized accounting software (Sage 50) will be procured by the project and will be used to manage financial transactions and produce timely and reliable financial reports. Those charged with governance will be responsible for mitigating the risk of 'override of internal controls' and ensuring that project funds are used as intended. The FM manuals will comprise a clear set of internal controls for addressing the expenditure items for training workshops, operating costs, and contract payment registers for goods, works, and services, including processing/approval of interim payment certificates. The involvement of the internal audit departments of MOWRAM and MAFF to carry out the annual project audit, including the audit of subgrants and post review of procurement contracts, will ensure that a check and balance mechanism and internal control systems are in place, that assets are being managed, and that resources are being used satisfactorily.

17. **Funds flow from IDA and DAs.** MOWRAM and MAFF will open a separate DA at the NBC to receive advanced funds from IDA. The segregated DA-A of MOWRAM and DA-B of MAFF will be denominated in US dollars to pay for suppliers, contractors, and service providers as per the approved AWPB. The DA ceiling is variable and based on the AWPB's two-quarters of cash flow forecasts; the ceiling will be approved by the World Bank.

18. **Periodic financial reporting.** Financial reports will be submitted to the World Bank within 45 days after the end of each semester, and the World Bank will acknowledge receipt of the reports and will review the content. The format and content of such reports will be confirmed and agreed on with the World Bank. MOWRAM and MAFF will prepare semiannual IFRs for their respective components. The IFRs will be produced based on the cash basis of CPSAS, reflecting the sources of funds of the project and the project's financial position. The IFRs also provide a snapshot of project implementation progress as follows: (a) the IFRs will capture financial transactions, including the allocation of expenditures in accordance with the respective components, disbursement categories, and sources of funds; and (b) the IFRs will provide a variance explanation of the use of funds by comparing the actual against the planned budget. The IFR is subject to audit by the external auditor as part of the audit field work.

**Figure 1.1 CaWSIP's Fund Flow Diagram and e-disbursement from IDA**




19. **Arrangements for external audit.** For the World Bank-funded projects, an external auditor (private audit firm) will be appointed for the project by the MEF via bundle audit arrangements with a TOR acceptable to the World Bank. The external auditor will carry out the financial audit according to the Cambodian International Standards on Auditing and will cover all sources of funds and all aspects of project activities implemented, including verification of expenditures; eligibility; field visits to subproject offices; review of contract management; physical verification of goods, civil works, and services acquired by the project; and carrying out a post procurement review. The consolidated audited financial statements and the combined Management Letters of each PMU will be submitted to the World Bank within six months after the end of each financial audit. The World Bank will review the reports and acknowledgment of receipt will be sent to each PMU. The project will comply with the World Bank Policy on Access to Information. The audited project financial statements (without any restrictions for end users) will be posted on the website of MOWRAM and MAFF for external access.

20. **Financial covenants.** The project's financial covenants include: (a) maintaining an acceptable FM system and accountability arrangements throughout the life of the project; (b) submitting IFRs within 45 days after the end of each semester; (c) submitting AWPB to the World Bank for 'no-objection' by end of November each year; (d) quarterly reporting on eligible expenditures made from the DA to the World Bank; and (e) submitting Annual Audited Project Financial Statements and Management Letters within six months of the year-end.

21. **Oversight and monitoring arrangements**. The World Bank will conduct implementation support missions, including field visits, to review FM performance. In the first year, there will be more frequent visits to enhance FM capacity, accelerate key FM advance actions, ensure that front-end FM activities are completed, and provide FM orientation/trainings. In subsequent years, the World Bank will conduct supervision missions twice a year.

22. **Disbursement arrangements**. The Credit proceeds will be disbursed to the project according to the Disbursement and Financial Information Letter (DFIL). The project will allow the following withdrawal application types: direct payment, reimbursement, advance to DAs, advance to and documentation of DAs, documentation of prior advance to DAs, and special commitment. The supporting documents for reporting expenditures made by the DAs to the World Bank are SOEs. The frequency of reporting on expenditures made from the DAs to the World Bank is quarterly. The minimum value of each application is US$100,000 equivalent for direct payments, reimbursements, and special commitment for goods, works, and services. The project will have a disbursement deadline date of four months after the closing date specified in the Financing Agreement. In the first year of implementation, MOWRAM and MAFF will be trained on the disbursement methods and procedures of the World Bank, including the use of the web-based disbursement of funds from the World Bank (e-Disbursement through the Client Connection website). The project will follow the Loan Handbook for World Bank Borrowers, April 2017, and the Disbursement Guidelines for Investment Project Financing, February 2017. The IDA Credit proceeds will be disbursed against eligible expenditures (Table 1.4).

**Table 1.4 Distribution of project budget per expenditure categories**

| Category | Amount of the Credit Allocated (expressed in US$) | Percentage of Expenditures to be financed (Inclusive of Taxes) | Responsible Implementing agencies |
|---|---|---|---|
| (1) Goods, works, non-consulting services, consulting services, operating costs and training for Component 1,2, and 4.1 of the Project. | US$ 123,000,000 equivalent | 100% | MOWRAM |
| (2) Performance-based Budgets | US$ 2,000,000 equivalent | 100% | MOWRAM |
| (3) Goods, works, non-consulting services, consulting services, Operating Costs and training for Component 3, and 4.2 of the Project. | US$ 20,000,000 equivalent | 100% | MAFF |
| (4) Emergency Expenditures under Component 5 of the Project | 0 | 100% | |
| **TOTAL** | **145,000,000** | **100%** | |

23. **Retroactive Financing**. Withdrawals up to an aggregate amount not to exceed SDR 2,000,000 may be made for payments made prior to this date but on or after June 30, 2023, for Eligible Expenditures under Categories (1) and (3).

24. **Performance based budgets (PBB).** The performance-based budgets ensure the transfer of funds to PDWRAMs and FWUCs based on measurable performance on sub-national stakeholder engagement, site supervision, and O&M services. The PBB will be used to set up a system for fund transfer between MOWRAM and PDWRAMs/FWUCs and to empower and build human capacity for PDWRAMs to: (a) manage and follow-up on the activities specified under Subcomponent 2.3; and (b) build capacity among PDWRAM staff to support the FWUCs in their task to deliver irrigation services and O&M functions. The PBB Guidelines will be developed to guide PDWRAMs on the eligible expenditures and method of verification of outputs. The guidelines will provide details on fund flow arrangements, the account system,

monitoring and reporting requirements, and conditions/requirements for output-based payments and verification to be made by MOWRAM under Subcomponent 2.3. The PBB has a fixed sum of US$2 million over the life of the project. The guidelines will form an integral part of the POM, which will be submitted for the World Bank's no objection prior to the effectiveness of the Financing Agreement.

25. **Contingent Emergency Response Component (CERC)**. The CERC is a 'zero component,' and no withdrawal can be made under it until the Government has: (a) prepared and disclosed all safeguards instruments required for activities under Component 5 of the project, if any, and implemented any actions required to be taken under said instruments; (b) established adequate implementation arrangements, including a positive list of goods and/or specific works and services required for emergency recovery, satisfactory to IDA, including staff and resources for the purposes of said activities; and (c) submitted the CERC manual and Emergency Action Plan for World Bank approval.

**C. Procurement**

26. **Applicable procurement procedures.** Procurement will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers Fifth Edition. Procurement under National Procedures will be carried out in accordance with Government Standard Operating Procedures and Procurement Manual updated on December 2, 2019, which is issued pursuant to Article 2 of the Kingdom of Cambodia's Law on Public Procurement dated May 16, 2023, subject to the additional provisions included in the Procurement Plan. STEP, which is a web-based tool for procurement planning, tracking procurement transactions and contract management, streamlining and automation, and monitoring and reporting, will be used for this project.

27. **PPSD.** The PPSD is jointly prepared by the executing agency and implementing agencies with the support of the World Bank. It is based on the long form of the PPSD shared by the World Bank. The PPSD is a living document and is subject to revision as needed.

28. **Scope of procurement.** Major procurement items to be financed by the project include: (a) rehabilitation and modernization of head works to farm levels; (b) rehabilitation and upgrading of multipurpose reservoirs for domestic water supply, irrigation, and flood control; (c) rehabilitation and upgrading irrigation at the potential sites of Cambodia Agricultural Sector Diversification Project (CASDP) and Cambodia Land Allocation for Social and Economic Development Project III (LASEDIII); (d) rehabilitation and construction of water storage for public waterworks and private water utilities under the Water Supply and Sanitation Acceleration Project (WASAC); (e) construction of small infrastructure, including collection centers, storages facilities, market sheds, and training center at PDAFFs; (f) selection of detailed design and supervision firms for civil work packages, the development of RBMPs and the formation of RBCs for sustainable operational mechanisms and functionality in selected river basins; (g) selection of a consulting firm to design guidelines and training manuals for development and implementation of agriculture techniques and methods; (h) selection of a consulting firm to facilitate farmers or ACs to pilot CSA/LEA techniques; and (i) selection of a consulting firm to develop and improve the regulatory framework and legal documents. The cost of these procurement items accounts for about 83 percent of the total project cost, therefore, they are considered critical for the project. Successful implementation of these activities will ensure the achievement of the PDO.

29. **Implementation arrangements.** Procurement activities will be undertaken by the assigned procurement team of MOWRAM and MAFF. Both MOWRAM and MAFF have established procurement teams with clear responsibilities that are accountable for carrying out all of the project's procurement activities.

30. **Procurement risks and mitigation measures.** The overall procurement risk of this project is Substantial. The World Bank team has conducted a procurement risk assessment for the project and identified the key risks. The assigned procurement team from MOWRAM and MAFF have had some exposure to the ADB and World Bank procurement processes from previous projects but have limited practical experience in implementing procurement as it has been carried out by procurement consultants. The key procurement risks identified include a lack of procurement capacity and experience in the client's procurement team, weak procurement monitoring systems leading to inefficiency in the procurement review and decision process, and insufficient delegation of power to the procurement review committee members. This may lead to protracted procurement processes that in turn lead to project implementation delays. Another key risk is weak governance, leading to potential conflicts of interest not being identified and fraudulent/corrupt practices, as well as the limited contract management capacity of the procurement team. This can be mitigated by using external procurement consultants to provide hands-on support in terms of development of procurement documents and TORs, guidance for the bid evaluation committees, and drafting procurement reports and decision documents. The possible unavailability of qualified procurement and technical consultants to support the project implementation is a risk, and the World Bank has been supporting the executing agency and implementing agency in drafting TORs for key consultants since after the loan negotiations. The consultants are expected to fully aware of the World Bank's Anti-Corruption requirements.

31. Other risk mitigation measures include putting in place and implementing an effective procurement monitoring system to ensure an efficient internal procurement review process. This will be facilitated by proper delegation of authority to the members of all procurement review committees. Mitigation measures to address governance risks also include establishing a complaint handling mechanism and enhanced disclosure of procurement information, including publication of the annual Procurement Plan and a quarterly summary of the contract award information for all procurement in local newspapers and on the project's website. This will reduce the risk of conflicts of interest, fraud, and corruption. External procurement consultants can assist the ministries with this work.

32. The composition of the bid evaluation and procurement review committees have been outlined promptly since after project negotiations and consisted of a limited number of people who are awarded sufficient resources to do the work properly. Contract management plans shall be prepared and continuously monitored for complex work and consultancy contracts to ensure that all work is completed as per schedule and meets the required quality standards. World Bank staff and/or consultants will provide procurement clinics/contract management training and hands-on support to the procurement team during project implementation, as needed. Training on the World Bank's Anti-Corruption requirements, including how to screen for early indicators of 'red flags,' will be provided.

33. **The WBG's oversight of procurement will be done through increased implementation support**. Procurement supervision will be part of the semiannual project implementation support missions, and procurement clinics/trainings will be conducted based on need. In addition to the prior review by the World Bank based on the prior thresholds, which are subject to change according to the results of risk assessments carried out during the project implementation, the World Bank will carry out the annual procurement post review on a sample of at least 20 percent of all post review contracts financed by the project. STEP will help the World Bank monitor procurement progress and take appropriate supportive actions in due course. The World Bank also requires the assigned procurement officers of executing agencies and implementing agencies to promptly update the procurement tracking and monitoring form in the standard operating procedures to monitor procurement performance.

34. **Procurement Plan.** Based on the PPSD, the first 18-month procurement plan for the project will be jointly prepared by MOWRAM and MAFF with the support of the World Bank. It is attached as annex to the PPSD**.**

35. The World Bank's procurement supervision (part of implementation support missions or separate) will be carried out through: (a) semiannual project implementation support missions; (b) prior review by the World Bank based on the prior thresholds, which are subject to change according to the result of risk assessments carried out during project implementation; and (c) an annual procurement post review on a sample of at least 20 percent of all post review contracts financed by the project. The STEP procurement system will help the World Bank to monitor procurement progress and take appropriate supportive actions where needed. Each implementation support mission will request information about any issues reported concerning possible fraud and corruption and will document these in mission files to share internally with the World Bank in line with standard processes and guidelines.

## ANNEX 2: Detailed Project Description

**COUNTRY: Kingdom of Cambodia**
**Cambodia Water Security Improvement Project**

1. The Cambodia Water Security Improvement Project (CaWSIP) aims to enhance water security in selected basins in Cambodia through promoting sustainable utilization of water resources, rehabilitating irrigation infrastructure and enhancing water service provision, introducing climate resilient farming practices, and strengthening connections between farmers and the private sector in providing irrigation water services. Water security, in this context, is defined as "the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems, and production, coupled with an acceptable level of water-related risks to people, environments and economies" (Grey and Sadoff 2007). While the project may not be capable of uniformly addressing all dimensions of water security, Component 1 of the project seeks to establish the foundational institutional framework to scale up water security investments in other basins through future projects.

2. The geographical scope of the CaWSIP covers the Staung and 3S/5P river basins, covering an area of more than 80,000km$^2$ in Eastern Cambodia. The seven provinces that make up the project area—Kampong Thom, Kratie, Mondulkiri, Preah Vihar, Ratanakiri, Stueng Treng, Tboung Khmum—equate to over 40 percent of the total area of Cambodia, but only 15 percent of the total population. Communities in this region are predominantly rural and encompass roughly 30 percent of Cambodia's farmer headed households. These provinces experience high rates of poverty and lack basic water and irrigation facilities compared to other parts of the country. Agriculture is the main livelihood model and year-round availability of water of sufficient quality and quantity is the entry point to improve rural economy and poverty reduction.

3. The 3S river system include the Sekong, Sesan, and Sre Pok Rivers, and the 5P include the Prek Preah, Prek Krieng, Prek Kampi, Prek Te and Prek Chhlong Rivers. Their associated river basins within Cambodia are categorized as low development areas in which the population are vulnerable to livelihood constraints and climate change impacts. The project will initially focus on the 3S/5P river basins for two subprojects (Srae Huy) and (Svay Chrum). A feasibility study for these subprojects was prepared. The feasibility study identifies interventions, such as the rehabilitation and upgrading of existing reservoirs and irrigation systems, of which the details are described under Component 2 below. The feasibility study for two additional subprojects is expected to be prepared under the project in years one to three of implementation and construction works are expected to start in year four. MOWRAM has proposed a long list of priority irrigation systems requiring rehabilitation and upgrading, out of which the additional sub-projects will be selected. The project will finance civil works in these basins as well as RBMPs for three basins (Sre Pok and Prek Te, and other basins to be selected by MOWRAM).

4. The project has three closely linked technical components. The project's three main components and project activities were developed through extensive consultation with MOWRAM, MAFF, and other relevant stakeholders.

5. **Component 1: Improved Water Resources Planning and Institutions (US$10 million, IDA).** This component will review policies and regulations, and their adequacy for supporting water resources management and dam safety with the overarching goal of operationalizing them. Furthermore, the component will strengthen data collection, analysis, and transboundary data sharing with Viet Nam. The improved regulatory framework and strengthened data and analytics will support the preparation of RBMPs that serve as a long-term basin wide development tool to manage and sustain water resources and guide strategic investments in the selected priority basins. The component will support establishing RBCs to support and coordinate basin-level development. Finally, the component will develop the institutional capacity of MOWRAM, PDWRAMs and other provincial stakeholders.

6. **Subcomponent 1.1: Strengthening water resources institutions and national policies. (US$2 million, IDA)** This subcomponent will focus on reviewing and revising, when needed, key legislation and policy documents, ensuring a sound legislative foundation for IWRM. This will include the review of sub-decrees on water allocation and licensing, water quality, as well as the role of RBCs. The subcomponent will also support the preparation of guidelines for dam safety and management practices that will be integrated into the national dam safety framework developed under the project. Finally, the subcomponent would strengthen the policy and regulatory framework for any subsequent investments, ensuring the sustainability of all physical investments made under Component 2.

7. **Activities 1.1.1 Strengthening WRM policies.** This activity will review critical legislative documents, including the draft sub-decree on water allocation and licensing, which sets the rules for water allocation by sectors, including for water supply companies and village and domestic water users, among others. The sub-decree on water quality is a brief note of 16 articles that delegates the authority of managing, protecting, and improving water quality, including the setting up of water quality standards (Article 6) and protecting health, aquatic life, and usage for agriculture sector, to MOWRAM. Water quality classification is to be determined by a Prakas (Article 9). Finally, this activity will review sub-decree no. 98 on that roles and mandates of the RBCs, contributing directly to the development of RBMPs under Subcomponent 1.3.

8. **Activities 1.1.2 Strengthening dam safety policies.** The Water Law's sub-decree on FWUCs delegates the responsibility for the O&M of irrigation systems, including their service lands and canal networks, to the associated FWUC. The sub-decree does not differentiate responsibilities for irrigation systems of different sizes and complexities. Moreover, there are no guideline on dam design parameters and operation rules in Cambodia for minimizing flood risks and impacts to downstream communities. To strengthen dam safety, this activity will review existing policies and prepare national dam safety guidelines to be piloted in the targeted basins.

9. **Subcomponent 1.2: Water resources monitoring and information (US$3.5 million, IDA).** This sub-component will provide the necessary data, information and analytics for effective management of water resources in light of climate change at a national and local level. Activities will include the installation of hydro-met stations, data collection and establishment of a risk-based monitoring framework for dam safety and management, as well as for transboundary data sharing mechanisms between Cambodia and Viet Nam.

10. **Activities 1.2.1 Data collection, monitoring and transboundary data sharing.** The Water Law (2007) places emphasis on data, inventory of water resources, and sharing and use of information for planning and management. MOWRAM is mandated to develop a National Water Resources Plan (NWRP) and to oversee projects based on NWRPs. However, climate stations and monitoring networks are scarce, especially in the targeted project areas, which limits decision-making and planning. This activity will strengthen local rainfall and water level monitoring by installing four Automatic Water Level Monitoring Stations (AWLS) and Automatic Weather Monitoring Stations (AWS) in the catchments. A sensor-based automated system for water distribution will also be purchased and installed. The new database structure within MOWRAM will be supported by updated and calibrated hydraulic and hydrological models. MOWRAM will also receive support through the installation of new high-performance computing power, enabling it to run the models. Finally, the component will build on efforts made under the Mekong IWRM project and will strengthen transboundary data sharing between Cambodia and Viet Nam in the 3S and 4P river basins.

11. **Activities 1.2.2 Risk-based monitoring of dam safety.** Historically, Cambodia lacks a national inventory or register of dams. Dams, primarily developed for hydropower, irrigation, and water supply, use disparate systems to classify and monitor risks associate with dam failure. This activity aims to establish a national dam risk classification system and support the adoption of a risk assessment framework through pilots in the targeted basins.

12. **Sub-Component 1.3: Strengthening of basin governance and planning (US$4.5 million, IDA).** This sub-component will support the preparation of RBMPs in the Prek Te and Sre Pok sub-basins as well as other basins to be selected in conjunction with MOWRAM. The RBMPs will be used as a tool to inform long-term planning, development, and management of water resources in light of climate change impacts. The sub-component will support the establishment and strengthening of RBCs for these basins as well as transboundary water cooperation with Viet Nam. The data, analytics and policies established under Subcomponents 1.1 and 1.2 will directly contribute to the outcome of this sub-component.

13. **Activities 1.3.1 Preparation of Climate-informed RBMPs.** Past IWRM plans for Cambodia have had limited effectiveness given their wide focus, limited data and analytics, and lack of clear responsibilities in relation to the RBMPs' investment programs. This activity assists MOWRAM in developing RBMPs that focus on water resources challenges specific to the Prek Tek and Sre Pok basins, including transboundary water cooperation with Viet Nam (considering the transboundary nature of the Sre Pok basin). One additional basin will be identified in year one of implementation. The RBMPs will include an actionable investment program with dedicated roles and responsibilities for each stakeholder and a mix of investments that incorporate nature-based solutions and traditional approaches. Finally, the development of the RBMPs will include a comprehensive stakeholder engagement process and a capacity building program for MOWRAM with a special focus on women. Implementation progress will be monitored as part of the GAP.

14. **Activities 1.3.2 Establishment of RBCs.** Experiences from the establishment of RBCs in Cambodia demonstrate mixed results given limited funding, unclear roles and responsibilities, and a lack of clear mandates. This activity will benefit from the review of sub-decree no. 98 on the roles, mandates and composition of RBCs to be undertaken as part of Sub-Component 1.1. The review will identify the key impediments and the activity will address them by building technical and institutional capacity. The activity will establish two RBCs in the first year and one RBC in coordination with MOWRAM; the activity will also support a comprehensive capacity building program for both RBCs and PDWRAMs. RBCs will have a consultative function and act as a key coordinating body, guiding and facilitating basin-level development. The activity will support women's participation in RBCs and will aim to have at least 30 percent of members be women and at least two women in decision-making roles in each RBC.

15. **Component 2: Improve and Sustain Water Service Delivery (US$112 million, IDA)**. Cambodia faces limitations in managing its freshwater resources due to inadequate water infrastructure and O&M challenges in irrigation and water supply systems. Additionally, limited staffing capacity and budget constraints of PDWRAMs and FWUCs further exacerbate the situation, resulting in low to no water service delivery to domestic water supply, croplands, causing water shortage for domestic water use, low agricultural productivity, and environment that is further worsened by the impacts of climate change. To address these issues, Component 2 of the project focuses on improving water service delivery to multiple water users such as farmers in order to increase agricultural productivity, water supply utilities to secure water sources for sustainable access to water supply services and flood control to mitigate downstream community impacts.

16. To achieve the delivery of improved and sustained water services to end users, the component will finance: (a) the rehabilitation and upgrading of targeted existing water resources infrastructure; (b) the establishment of new or staff existing FWUCs and activities to support the financial sustainability of FWUCs; and (c) technical assistance to PDWRAMs/FWUCs to manage, operate and maintain these systems in an effective manner. Under this component, existing multipurpose water resources infrastructure will be rehabilitated, improving dam safety and increasing water retention capacity for irrigation and domestic water supply and flood control. In addition, the component will finance the modernization of irrigation facilities to improve performance of the irrigation systems to provide reliable and sustainable water service delivery to end users. Monitoring of water resources availability (Component 1) plays an essential role in achieving this.

17. Component 2 consists of three subcomponents:

(a) **Subcomponent 2.1.** This subcomponent will finance the construction works to rehabilitate and upgrade existing multi-purpose reservoirs for irrigation, water supply, flood control, and environmental benefits. Feasibility studies for the reservoirs in Svay Chrum and Srae Huy sub-basins of the 3S and 5P river basins have been completed. Additional projects will be selected during the implementation phase.

(b) **Subcomponent 2.2.** The subcomponent will finance the rehabilitation and upgrading of existing irrigation systems, including the irrigation infrastructure for the Svay Chrum and Srae Huy sub-basins. Additional irrigation systems, both reservoir-based or river diversion systems, will be identified and selected during the implementation phase.

(c) **Subcomponent 2.3.** This subcomponent aims to integrate institutional arrangements, technical capacity, and financial structures into a cohesive approach to enhance water service delivery. It will finance all the activities to support the PDWRAMs and FWUCs in Svay Chrum and Srae Huy and other irrigation schemes, ensuring that last mile irrigation services to farmers are delivered in a timely and efficient manner.

18. Subcomponents 2.1 and 2.2 focus on rehabilitating and upgrading water resources infrastructure to improve irrigation, domestic water supply, flood control, and environmental benefits, ultimately enhancing water service delivery. Sub-component 2.3 addresses capacity building for the institutions involved, ensuring effective management of the infrastructure through use of the water information system developed in Component 1 as well as the guidelines/manuals and financing mechanisms supported by irrigation fees. These combined efforts aim to improve and sustain water service delivery, which is a prerequisite for improving water security.

19. Furthermore, the infrastructure improvements made in Component 2 directly support Component 3, helping to further enhance water management and efficiency at the farm level. Integrated crop and water management practices enable farmers to increase productivity while using the same amount of water more efficiently. The rehabilitation and upgrading of irrigation facilities play a vital role in achieving these objectives.

20. The project will begin with the implementation Svay Chrum and Srae Huy reservoirs as the detailed design will be started soon. A long list of other potential projects has already been identified, and additional projects will be selected in collaboration with MOWRAM based on standard selection criteria. These criteria include the EIRR of infrastructure investments, low (manageable) E&S risks, cost per ha, willingness of farmers to maintain systems after completion, potential for agricultural diversification, and reliability of water availability. The specific interventions related to the subprojects are described below.

21. **Subcomponent 2.1: Rehabilitation and upgrading of multi-purpose water resources infrastructure (US33.5 million, IDA).** The Svay Chrum and Srae Huy reservoirs were built during 1970s. In 2005, the Svay Chrum reservoirs were rehabilitated under the World Bank's Agricultural Productivity Improvement Project (APIP-WB). However, due to a lack of routine surveillance and regular O&M, the condition of the dam has deteriorated over the past 20 years. Currently, the reservoir serves various purposes, such as irrigation for both wet and dry season paddy fields, a source of domestic water supply (delivered by trucks to nearby villages), and an essential water supply for livestock. The Srae Huy weir has been broken, affecting its year-round performance. The costs for the rehabilitation work are estimated at US$3.9 million for the Svay Chrum reservoir and US$12.45 million for Srae Huy weir.

22. To improve and sustain water availability to fit the demand, the following civil works interventions will be implemented under the project.

**Activities 2.1.1: Increasing storage capacity**

| Subproject | Interventions | Improvement |
|---|---|---|
| Svay Chrum | Dam rehabilitation and increasing dam height | • Svay Chrum storage capacity increases from 3.6 MCM to 6 MCM |
| Srae Huy | Reconstructing weir and building embankment at upstream of the weir (3.5 km) | • Srae Huy storage capacity increases from 0.27 MCM to 1.8 MCM |

**Activities 2.1.2: Improving dam safety**

| Subproject | Interventions | Improvement |
|---|---|---|
| Svay Chrum | • Reconstructing spillways for flood Return Period 100 year<br>• Upgrading the outlet gate with mechanical and remote-control gate.<br>• Installing water level gauge | • From small capacity flood release to RP 100-year flood release<br>• From non-functioning gate to modern automated gates |
| Srae Huy | • Constructing discharge gate with mechanical and remote-control operation options.<br>• Installing water-level monitoring gauge | • Modern automated gates<br>• Early warning system available for analyzing and identifying potential weather- and climate-related risks and hazards |

**Activities 2.1.3: Operating reservoir**

| Subproject | Interventions | Improvement |
|---|---|---|
| Svay Chrum | Establishing reservoir operating rules and water allocation procedures | More effective management of reservoirs |
| Srae Huy | Establishing reservoir operating rules and water allocation procedures | More effective management of reservoirs |

**Activities 2.1.4: Conserving biodiversity**

| Subproject | Interventions | Improvement |
|---|---|---|
| Srae Huy | Constructing fish ladder | Creating a structure that allows migrating fish passage over or around an obstacle on the river |

23. For additional sub-projects to be included, the nature of interventions is expected to be similar as outlined above. Some of the reservoirs will see additional benefits as they will provide sanctuaries for fish breeding during the dry season, creating a strong biodiversity benefit. Land acquisition issues are expected but will be dealt with in accordance with governing the World Bank's ESF procedures and government's safeguards documents.

24. **Subcomponent 2.2: Rehabilitation and upgrading of irrigation infrastructure (US$73.5 million, IDA).** The two irrigation schemes targeted under this subcomponent are made of a small dam and earthen canal; they encounter challenges due to limited capacity, resulting in frequent spilling and inadequate water supply for irrigation. The irrigated crops cover a small area and mainly consist of wet season rice with low water productivity. Inefficient flow measurement and control in the canal, as well as ineffective stream release, lead to inefficient water delivery and substantial losses downstream. Farmers also face difficulties in pumping water from shallow streams, and the maintenance of the canal system is poor, with sections that are overgrown and deteriorating. The costs for the rehabilitation work are estimated at US$6.1 million for the Svay Chrum irrigation facilities and US$4.25 million for the Srae Huy irrigation facilities.

25. To improve water access for reliable and sustainable water services delivery and increase agricultural productivity, the following interventions will be implemented under the project.

**Activities 2.2.1: Rehabilitation of infrastructure**

| Subproject | Interventions | Improvement |
|---|---|---|
| Svay Chrum | • Replacing the existing intake facilities<br>• Rehabilitating existing cross regulators and constructing new regulators<br>• Rehabilitating existing main canals and carrying out dredging activities | Improving water distribution and increasing service area for irrigated agriculture from 730 ha to 2,200 ha |
| Srae Huy | • Reconstructing intake facilities with automatic gates<br>• Rehabilitating and extending irrigation canals (main + secondary)<br>• Upgrading regulators | Improving water distribution and increasing service area for irrigated agriculture from 1,057 to 6,250 ha |

**Activities 2.2.2: Improving canal functionality**

| Subproject | Interventions | Improvement |
|---|---|---|
| Svay Chrum | • Installing flow measurement equipment to inform water allocation and an automated system to allow operators to set operation rules | Increasing water efficiency |
| Srae Huy | • Installing flow measurement equipment to inform water allocation and an automated system to allow operators to set operation rules | Increasing water efficiency |

26. The activities in additional schemes to be included will involve similar interventions consisting of improvements in water conveyance (for irrigation and drainage) and distribution infrastructure, canal safety structures, and water distribution structures together with flow measurement arrangements.

27. **Subcomponent 2.3: Improving institutional, technical, and financial capacity (US$5 million, IDA).** Existing FWUCs face challenges due to capacity limitations and financial constraints, resulting in limited water supply and ineffective infrastructure. This leads to insufficient water for crops and reluctance of farmers to pay irrigation service fees (ISF). The low collection rates cover only basic reservoir gate maintenance, causing inadequate O&M of the irrigation systems. Some downstream farmers do not receive regular water supply, and there is no developed annual irrigation plan.

28. To effectively manage the water that will become available after completion of the rehabilitation works under Subcomponents 1 and 2, a fully functional and staffed FWUC is required that manages, operates, and maintains the irrigation and drainage system. A well-performing FWUC provides some degree of certainty that farmers pay the ISF. The estimated budget for the implementation of activities under Subcomponent 2.3 is US$ 4.6 million for the Svay Chrum scheme and US$4.7 million for the Srae Huy scheme.

29. **Activities 2.3.1 Improving institutional systems.** The project will provide funding for the establishment of the FWUC in each scheme. To establish (or activate an existing) FWUC, an organizational structure at different levels, ranging from the community level to water user group levels, is required. These groups will be responsible for managing the

irrigation system within the hydraulic boundaries. Subgroups will be formed within the FWUCs, with each subgroup having specific responsibilities for areas such as upstream reservoirs, command areas, and approach canals. This division of tasks will ensure the effective and efficient management of the entire irrigation system.

30. **Activities 2.3.2 Improving technical capacity.** Technical capacity will be built among the FWUC and PDWRAM staff to perform all tasks as outlined in the O&M manual. This includes training programs on dam safety, dam O&M, water sharing plans for subprojects, water sharing, water operations g, FM and ISF collection. The tools that will be developed cover water allocation, system operations, asset management, and maintenance. These tools will enable the preparation of integrated annual water sharing plans, allocation rules, gate operations, and the tracking of infrastructure details through databases, maps, and charts. Ultimately, these efforts aim to enhance the efficiency of the irrigation systems' management, improve asset management practices, and establish robust M&E processes.

31. **Activities 2.3.3 Improving financial capacity.** Collection of the ISF is the main source of funding for the FWUCs. Farmers everywhere are willing to pay ISF if their required irrigation services are met. This requires that each FWUC first prepares a sound O&M manual and gets it endorsed by the members (farmers) so that there is ownership for undertaking O&M. The manual will also include a cost recovery assessment assuming the total cost required for O&M, which will help the FWUC set the ISF rate. Part of the O&M could be also executed through mobilizing voluntary contributions by farmers. This will reduce the overall ISF rate.

32. A system of ISF collection based on the cropping season will be established. ISF collection is higher during the dry seasons than the wet seasons, demonstrating the importance of dry season irrigation. The irrigation service delivery to each segment of the canal shall be monitored by the FWUC, and ISF will be collected based on the services farmers receive. The proposed installation of the measuring devices (2.2.2) to measure the flow in terms of quantity and timeliness of the irrigation service delivery will help assess the performance of irrigation delivery. All these measures will help improve ISF collection. In addition, the FWUC will be trained on accounting and bookkeeping (activity 2.3.2) to ensure transparency in ISF collection and expenditure. The details of income and expenditure will be shared with farmers through a general assembly meeting to ensure transparent functioning of the FWUC.

33. MOWRAM will start performance monitoring of the FWUCs, and the high performing FWUCs will be rewarded with additional incentives. This will help increase legitimacy and power of the FWUC and its recognition in the society, ultimately contributing to resource mobilization for the FWUCs.

34. **Component 3: Support Services to Increase Climate Resilience in Irrigated Agriculture (US$18 million, IDA)** will build on the investments supported under Components 1 and 2 and enable farmers to make the best use of the increasingly available irrigation water. Agriculture and water productivity will be increased through technical innovations and diversification of production systems. Improved irrigation, on-farm water management, and the dissemination and application of CSA technologies are key for improved productivity. With a closer involvement of private sector actors, improved irrigation and cropping techniques in combination with more diversified cropping patterns should lead to sustainable, higher farming returns.

35. With the subcomponent activities elaborated below, the project will lay the foundations for a broader adoption of viable crop choices and production techniques. The subcomponents will support: (a) improved adoption of CSA technologies and approaches to reduce climate related risks in irrigated agriculture, increase the efficiency of the use of agricultural inputs and reduce agricultural emissions. The focus would be on piloting and adoption of CSA/LEA technologies and practices, improving efficiency of water use and the integration of crop and water management; (b) improved service delivery to enhance the technical capacity of national/local research institutions and technical departments in technology

transfer, focusing on improving climate-smart and low-emission practices and value addition to help farmers to increase productivity, input use efficiency, and output quality and reduce their environmental footprint.

36. In parallel, the project will facilitate private sector actor engagement for value addition and market links, including the application of digital technologies to strengthen the marketing of agricultural produce.

37. The pilots and demonstration pilots financed by this component aim to prepare the groundwork for upscaling suitable and economically viable techniques by the RGC, with the potential support of a follow up project or through other Development Partner assistance. Under component 3, the CaWSIP will motivate behavioral changes towards environmentally friendly and technically and economically viable techniques that address climate change challenges.

38. **Subcomponent 3.1: Improved technology adoption (US$10 million, IDA)** will support capacity building and the implementation and operation of pilot sites and activities under the broader framework of CSA to enhance both production and productivity within targeted irrigation schemes. It will: (a) build farmers' capacity on integrated crop-water management practices to enable them to apply climate-resilient and water-efficient agricultural and water management practices that are both profitable and sustainable; and (b) finance technical assistance for the pilots and demonstration of CSA technologies and production models, such as AWD, SRI, crop diversification and solar-powered irrigation technologies, with the aim of producing more food and generating better incomes, while at the same time using the same amount of water at less social and environmental cost per unit of water.

39. CSA and LEA technologies and practices can play a critical role in shaping the agriculture sector of Cambodia to become climate resilient and low carbon. However, although farmers have started adopting several CSA technologies and practices, adoption rates are still low. While the need for adaptation is broadly recognized, CSA and low carbon emission techniques are still innovative approaches in Cambodia. The suitability of most important food and commercial crops will change as the climate changes; all regions of the country will most likely become progressively less suitable for producing rice, maize, and cassava. As a general response, increased and improved irrigation can partly mitigate the expected negative climate change impacts. Adopting CSA and LEA, in combination with increased water service delivery is expected to yield more sustainable results and will build resilience against climate-related production risks.[16] Support for productivity improvements will also include improving input use efficiency (fertilizer and other inputs) as well as better use of by-products to reduce waste.

40. Institutionally, the piloting will be accompanied by close collaboration of extension services with local and international research institutions to ensure technically sound implementation and monitoring of activities and results. In parallel, farms and other private sector partners will be closely involved in dissemination of results and information sharing on potential benefits, including the medium- and long-term possibility to reap carbon credit benefits from successful approaches.

41. There will be (at least) four pilots in each of the Svay Chrum and Srae Huy subprojects that will demonstrate and test:

(a) High-value cropping with drip irrigation
(b) Medium-value diversified crops
(c) Direct-seeded wet season rice for a four tons per ha yield.
(d) Laser levelling for bigger fields, outside of the crop diversification and direct-seeded rice pilots

[16] Resilient And Low-Carbon Agriculture in Cambodia - Climate Smart Agriculture Note, World Bank, June 2023.

42. The aims of the pilots are to expose the nearby farmers to new techniques and diversified cropping and demonstrate the functional benefits of laser levelling for bigger fields. Pilots will provide a focus for early training and extension activities and will also provide an opportunity to collect further data and experiences for simple comparisons of fertilizer rates, soil treatments, and so on. Initially, the nature and location of the pilots will be heavily influenced by water availability in the targeted irrigation schemes. CSA activities will be scaled-up when water availability improves as a result of the infrastructure rehabilitated under Component 2.

43. The pilots will be conducted on individual farmers' fields, generally larger landholders that have the resources and acumen to conduct their choice of diversified farming within (or away from) a rice system. The farmers will be assisted in the pilot with the provision of laser levelling for bigger fields, specialized equipment, input supply, and advice on growing the diversified crop. They will prepare the land, irrigate, and grow the crop themselves.

44. **Subcomponent 3.2: Improved service delivery (US$8 million, IDA).** This sub-component aims at enhancing technical and institutional capacities of public, private sector, and academic institutions, including MAFF/PDAFF, equipment/ input providers, services providers, farmers and farmer organizations and other relevant public and private stakeholders to provide effective water supply and extension services to individual farmers and groups (FWUCs and Agriculture Cooperatives (ACs)) for adopting and scaling up CSA approaches. Key activities will include the following:

(a) Creating platforms at the local and national levels for promotion of CSA approaches, including E-extension, to raise awareness among local authorities and farmers.

(b) Implementation of e-Extension services and certification programs for seeds and agricultural best practices to promote sustainable farming methods. The e-Extension services will provide farmers with digital access to agricultural expertise, resources, and support. The certification program for seeds and farming best practices will ensure quality and promote the adoption of sustainable and low emission agricultural techniques.

(c) Formulation of national guidelines on CSA, building on existing certifications, similar to the Cambodian Good Agricultural Practices (CamGAP).[17]

(d) Building technical and institutional capacity of Government officials, private sector actors, and academic institutions for promotion and application of CSA and LEA.

45. AWD is a water management technique practiced cultivating irrigated lowland rice with much less water than the usual system. AWD will be promoted as a technique suitable for low-capacity environments amongst rice farmers in areas that already, or will, benefit from well managed irrigation and drainage services. This could open carbon financing options in the medium and long-term.

46. The MAFF, its line agencies, related research institutions, NGOs, and private sector partners will be supported to raise awareness and build capacity at different levels to promote and scale up labor, water, and crop productivity improvement techniques and practices in line with the CSA guidelines developed under this subcomponent. A broad range of climate smart technologies have been implemented and can be adopted by others to develop climate resilient agricultural systems, including crop diversification and various water control and agronomic technologies. The project will

[17] Cambodia Good Agriculture Practices (CamGAP) is a national assurance system to prevent or minimize hazards associated with: (i) food safety; (ii) environmental impacts; (iii) worker health, safety and welfare; and (iv) produce quality in line with the ASEAN Good Agricultural Practices (FAO, 2020 (document: TCP/CMB/3608)).

prepare an awareness-raising plan and will communicate content through different mechanisms to help farmers become adequately informed of climate change induced risks, impacts, and adaptation strategies.

47. **Component 3 would support farmers in applying relevant and, where needed, adapted CSA tools and technologies for both rice and non-rice crops in pilot areas and beyond**. Capacity-building and outreach activities will start immediately after project effectiveness in order to prepare the groundwork for stakeholders to carryout concrete pilot activities (under component 3) in year two of project implementation. For the Svay Chrum and Srae Huy sub-projects, on-farm changes through demonstrations/pilots are mostly expected to start in year three and four after completion of the construction works. The capacity development will follow three stages: needs assessments, preparation of capacity development plans (including preparation of training materials), and execution of the capacity building programs.

48. Part of the capacity development program under Component 3 covers the adoption of innovative techniques in on-farm water provision such as laser land leveling and solar-powered irrigation techniques. Demonstrations and potential exchange visits will help to facilitate successful adaptation and adoption at project sites. Private sector actors (vendors and service providers) will play a key role and are expected to be strengthened technically to prepare them for extended and expanded service delivery.

49. While not a core activity, the project will facilitate the establishment of contract farming between the private sector and farmers (agricultural cooperatives and producer groups). Given the persistent difficulties for private service providers and farmers/groups to access suitable financing solutions, the project information and outreach activities will help bring actors together to exploit synergies and smoothen local value chains. Supporting close engagement with private sector marketing institutions will be key for viable subprojects and for quick and broad dissemination and adoption of new CSA production systems.

50. At a strategic, central level, a review of existing policies and strategies on CSA application will be conducted. Based on such review and identified gaps, relevant policies and strategies and the national guidelines will be prepared/updated as required.

## ANNEX 3: Gender Analysis

**COUNTRY: Kingdom of Cambodia**

**Cambodia Water Security Improvement Project**

1. An analysis on gender in the water sector in Cambodia was recently conducted to identify the most relevant gender gaps and suggest measurable actions to be taken by the project. Specific issues that were examined included women's limited representation and participation in decision-making in water resources management and governance. The analysis also examined the existing sector plans and strategies to consider recommendations to empower women in the FWUCs and RBCs.

2. **Women in Cambodia represent a large share of the agricultural workforce and food producers.** In Cambodia, women represent 74 percent of the agricultural workforce, produce 80 percent of the food, and comprise 62 percent of the members of agricultural cooperatives. There is an increasing acknowledgment of the role that women play in agriculture, as producers, processers, or retailers of agricultural products. Agricultural cooperatives run by women tend to be inclusive, allowing the participation of members with different productive capacity and outcomes, offering opportunities to female heads of households or landless women, and are better at accommodating women's needs.

**3. Women are scarcely represented in FWUCs and RBCs, both as members and in decision-making positions within the committees.** Gender norms ascribe men as key holders of technical knowledge and skills, giving them access to capacity building, machineries, and technologies and entitling them to hold decision-making powers. Moreover, FWUCs are typically chaired by local political and administrative officers, such as commune and village chiefs, positions in which women are largely underrepresented. The burden of care work also limits their attendance at meetings, networking events, as well as their mobility, which is crucial for holding public roles. As a result, women's water needs, either for home consumption or production, often go unheard. The national average of women elected in the FWUCs was 14 percent, and they tend to be inactive or resign after a while. Decision-making roles are almost entirely held by men. In project areas, candidates for FWUCs were selected by local authorities and women were not fully aware of the FWUCs' selection processes. There are also no national guidelines for setting a quota for women's participation in the FWUCs.

4. **All national and provincial RBCs are represented from nearly all ministries except for Ministry of Women's Affairs (MOWA) and are led by public offices that do not favor women's participation.** The Sub-decree on the River Basins establishes the composition and role of the National River basin committee and provincial RBCs, which are entities led by provincial governors and include district and commune authorities and representatives of line ministries. Nearly all ministries are represented in the central and provincial structure, except for MOWRAM, and no reference is made to gender mainstreaming or women's inclusion in decision making concerning WRM. A manual released by MOWRAM and JICA in 2019 describes the process of establishing the Provincial RBC: the main stakeholders and decision makers involved include provincial governors and vice-governors, MOWRAM provincial directors, municipality, district and commune chiefs, and chairman of FWUCs (MOWRAM & JICA, 2019). The required process and establishment limit women's representation and decision making as women do not have equal share in technical and decision-making role compared to men at these institutions.

5. **FWUCs do not serve the productive activities of female water users.** Women use water for productive activities, such as vegetable cultivation and animal breeding or post-harvest and processing tasks. Men do not share the same level of responsibility concerning household water provision and tend to consider productive use of water separately while focusing on irrigation as an opportunity to increase rice production. FWUCs tend to be overwhelmed by various constraints and unequal use. FWUCs serve water users who rely on irrigation to grow non-rainfed cultivations, such as dry season rice; not all community members share the same interests. Women appeared particularly estranged from the FWUCs as

their productive activities often rely on different options and also because women are overrepresented among the poor. In areas such as Kratie or Mondulkiri, with many and varying productive options and practices, the FWUCs' visions may need to be adapted and be more inclusive. In fact, according to the gender analysis, women are deeply interested in having access to water supply for their households and their production areas, which are typically not too far from home to cope with their family care duties. Moreover, the new water reservoirs envisaged by the project represent a resource for fishing, gathering of small aquatic animals, or opportunities for growing aquatic vegetables; all these activities are relevant for women, especially for the poorest ones. FWUCs are planning to charge fees for using reservoir water resources, including for growing vegetables and small animal farms. There is a need for including women in these discussions, to make sure that the FWUCs adopt rules that are shared and inclusive and do not exclude or marginalize women.

6. **Institutional preparedness.** MOWRAM and MAFF have different capacities. Gender mainstreaming is project-driven and influenced by development partners. Provincial gender focal points lack influence in their role, and their capacity for conducting gender analysis remains weak. Opportunities for learning and knowledge are also still suboptimal. The MOWRAM/MAFF has strengthened and reorganized its subnational gender focal point structures.

## ANNEX 4: MAP of Project Location

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